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COUNTY BOROUGH OF BOOTLE



ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

for the year ended 31st December, 1948

AND

Report on an Investigation into the Infant
Mortality of the Borough during the year 1947.

JAMES F. SWAN,
M.D., D.R.C.O.G., D.P.H.
MEDICAL OFFICER OF HEALTH.

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BOOTLE:
BOOTLE TIMES, 30, ORIEL ROAD.

CONTENTS.

	PAGE.
FOREWORD	3
SECTION I CONSTITUTION OF COMMITTEES	6
SECTION II STAFF	8
SECTION III VITAL STATISTICS	10
SECTION IV COMPARISON OF STATISTICS WITH THOSE OF PREVIOUS YEARS	11
SECTION V SERVICES PROVIDED UNDER PART III OF THE NATIONAL HEALTH SER- VICE ACT, 1946	16
(i) <i>Care of Mothers and Young Children</i>	16
(ii) <i>Municipal Midwifery Service</i>	20
(iii) <i>Health Visiting</i>	21
(iv) <i>Home Nursing</i>	22
(v) <i>Vaccination and Immunisation</i>	23
(vi) <i>Ambulance Service</i>	25
(vii) <i>Prevention of Illness (Care and After-care)</i>	26
(viii) <i>Domestic Help Service</i>	27
SECTION VI MENTAL HEALTH SERVICE	28
SECTION VII DENTAL TREATMENT	30
SECTION VIII INFECTIOUS DISEASES	31
SECTION IX TUBERCULOSIS	33
SECTION X VENEREAL DISEASES	37
SECTION XI HOUSING	38
SECTION XII MISCELLANEOUS:—	
(i) <i>Cancer Scheme</i>	39
(ii) <i>Poor Relief</i>	39
(iii) <i>Medical Out-Relief</i>	39
(iv) <i>Blind Welfare</i>	39
SECTION XIII SANITARY CIRCUMSTANCES	40
INDEX	48

FOREWORD.

*To the Mayor, Aldermen and Councillors
of the County Borough of Bootle.*

MR. MAYOR, MADAM AND GENTLEMEN,

I have pleasure in presenting to you my first Annual Report, the seventy-sixth of the series, on the health of the people of the County Borough of Bootle.

The work of the Department as set out in the following pages was carried out for part of the year under the supervision of my predecessor, Dr. F. T. H. Wood, who retired from the Corporation's service during the year after 28 years as Medical Officer of Health.

Dr. Wood's departure from office coincides with the end of an era of great development in preventive medicine, both in the environmental and the personal services. During this epoch medical officers of health cheerfully shouldered the burden of expanding the maternal and child health service and played a notable part in the evolution of the schemes for the prevention and treatment of tuberculosis and venereal disease, for the control of infectious disease, for the provision of hospital accommodation, for the routine inspection and treatment of school children, for health education and for supervision of the hygiene of food and other commodities. This era was cut short by the second world war and finally closed by the inception of the National Health Service Act, 1946. While the medical officer of health must suffer a pang of regret at being divorced from some of these functions which he developed and nurtured for so many years, he is, on the other hand, consoled by the knowledge that he now has more time to devote to his primary function of dealing with purely epidemiological problems.

The progress of the local health services during the past quarter of a century constitutes a monument to Dr. Wood which will not soon be forgotten. There are few spheres of public health to which he has not made important contributions; he was active in many fields outside his own Department and his reputation is a national one. I know that

you will join me in wishing him happiness in his retirement, a retirement which is not an idle one, but in which he is still placing his knowledge at the disposal of several public bodies where his ripe experience will prove of great value.

The County Borough Council became a Local Health Authority under the National Health Service Act, 1946, on 5th July, 1948, and effect is now being given to your proposals which were detailed in the Annual Report for 1947. The assuming of these new powers and duties has not been accomplished without initial difficulties, but on the whole matters have proceeded satisfactorily, and the extent to which it has been necessary for you to seek power to widen the scope of your original proposals bears testimony to the advantage which the public is taking of the services offered.

A notable feature of the year's statistics is the Death-Rate which, at 10·6 per 1,000 of the population, is the lowest ever recorded in the Borough and for the first time on record is less than the figure for England and Wales. As in 1947, there has been no maternal death during the year. The Infant Mortality Rate shows a considerable reduction last year, and is the lowest ever recorded in the Borough. It is, however, still substantially above the national average, and continues to give cause for dissatisfaction. Detailed reference is made to this in the body of the Report.

I am deeply perturbed by the depletion of the staff of dental officers. The establishment of dental officers is three, but we were unable to obtain the services of more than two during 1948, and shortly after the end of the year one of these left the municipal service to take up private practice, where the financial rewards offered are so much higher. This shortage militates most of all against the school children, but also against the expectant and nursing mothers and young children, and it is a matter for great regret that the priority classes should be neglected to such a deplorable extent.

Difficulty in obtaining experienced clerical staff is likewise a serious one, and senior officers of the Department are obliged to spend on routine duties time which their experience qualifies them to employ to much better advantage on problems of research and technical development.

The housing shortage in the Borough continues to give rise to anxiety. This is a state of affairs which will take some years to overcome, and it is hoped that the supply of labour and materials will improve to such an extent as to permit, as an interim measure, of the reconditioning and improving of insanitary houses with a view to mitigating as far as possible the hardships which so many of their occupants have to bear.

The problem of atmospheric pollution is a serious one in Bootle, and I would commend to your continued support the efforts of the National Smoke Abatement Society, which, by the education of stokers and in many other ways, has done so much to ameliorate conditions in many industrial centres. I would also advocate a widening of your powers of control over the smoke nuisance when the matter of extension of powers by local Act next comes up for consideration.

Another matter worthy of note concerns the ambulance service. Shortly after the inception of the National Health Service Act on 5th July, it became clear that the existing staff was inadequate to cope with the additional work, and delays and complaints were frequent. After much procrastination, doubling of the staff towards the end of the year brought about great improvement, although I feel that a further augmentation of the staff may have to be considered before long, as well as the question of accommodation for vehicles and staff.

In conclusion, I should like to tender to you, and especially to your Health Committee and its Chairman, my thanks for your encouragement and consideration, and to my staff my grateful acknowledgment of their support and excellent efforts.

JAMES F. SWAN,

Medical Officer of Health.

Section I.

Constitution of Committees

Health Committee

COUNCILLOR DR. BROWN, J.P., Chairman.

MR. COUNCILLOR CULLEN, J.P., Deputy Chairman.

HIS WORSHIP THE MAYOR (T. HARRIS, ESQ., J.P.).

MR. ALDERMAN HUGHES.	MR. COUNCILLOR HARDACRE.
MRS. ALDERMAN PRITCHARD.	COUNCILLOR DR. HARRIS, J.P.
MR. COUNCILLOR CAIN, J.P.	MR. COUNCILLOR HARRISON.
MR. COUNCILLOR CONNOLLY.	MR. COUNCILLOR J. S. KELLY.
MR. COUNCILLOR CRIGHTON, J.P.	MR. COUNCILLOR ROGERSON.
MR. COUNCILLOR DOOLEY.	MR. COUNCILLOR WILLIAMS.

Co-opted Members :—

Representatives of the Bootle Medical and Panel Committee:

DR. T. M. JONES and DR. N. L. BENNIE.

Representative of the Bootle Local Dental Practitioners Committee:

MR. A. W. THOMPSON.

Representative of the Bootle Pharmaceutical Committee:

MR. L. D. PARRY.

Representative of the Bootle General Hospital:

MR. W. ROSS, J.P.

Blind Welfare Committee

(To 4th July, 1948).

MR. COUNCILLOR ANDERSON, Chairman.

MR. ALDERMAN LENNIE, Deputy Chairman.

HIS WORSHIP THE MAYOR (T. HARRIS, ESQ., J.P.).

MR. ALDERMAN HODGSON.

MR. COUNCILLOR HEVEY.

MRS. ALDERMAN PRITCHARD.

MR. COUNCILLOR HUGHES.

MR. ALDERMAN RAINFORD, J.P.

MR. COUNCILLOR MOORE.

MR. COUNCILLOR CONNOLLY.

MR. COUNCILLOR ROGERSON.

MR. COUNCILLOR CRESSWELL.

MR. COUNCILLOR TRAVERS.

MR. COUNCILLOR CRIGHTON, J.P.

Representative of the School for the Blind:

MR. J. H. MINES.

Representative of the Liverpool Workshops for the Blind:

CAPTAIN E. HALLOWAY.

Representative of the National League for the Blind:

MR. W. FRANCE.

Representative of the Catholic Blind Asylum:

REV. S. ROBERTS.

Section II.

Staff

Medical Officer of Health:

F. T. H. WOOD, O.B.E., M.D. (LOND.), B.S., B.Sc., D.P.H. (to 17th August)

J. F. SWAN, M.D., CH.B., D.R.C.O.G., D.P.H. (from 18th August).

Deputy Medical Officer of Health:

J. F. SWAN, M.D., CH.B., D.R.C.O.G.,
(to 17th August). D.P.H.
(Vacant from 18th August).

Assistant Medical Officers of Health:

M. B. CLARKE, M.B., CH.B., D.P.H.
J. H. BREWSTER, M.B., CH.B., D.P.H.

Tuberculosis Officer:

R. HANNAH, M.C., M.B., CH.B., D.P.H.

Senior Dental Officer:

H. B. DAWES, L.D.S.

Assistant Dental Officers:

E. G. O'SHEA, B.D.S.
(One vacancy).

Administrative Assistant:

N. LOCKWOOD (to 31st August).
H. ALLEN LORD, B.A., A.C.C.S. (from
5th July).

Superintendent Nursing Officer:

MISS E. JACKSON, S.R.N., S.C.M.,
H.V.CERT. (from 8th July to 23rd
October; vacant from 24th October).

Health Visitor (Tuberculosis):

MISS E. P. STARK.

Visiting Specialists:

I. A. TUMARKIN, M.B., CH.B., F.R.C.S.,
D.L.O., Aural Surgeon.
E. ALLAN, M.B., CH.B.,
Ophthalmic Surgeon.
F. C. DWYER, M.B., CH.B., F.R.C.S.,
M.CH.ORTH., Orthopaedic Surgeon.

Consultant Obstetrician:

P. MALPAS, M.B., CH.M., F.R.C.S.,
F.R.C.O.G.

Part-time Assistant Medical Officer:

G. LENNON, M.B., CH.B., D.R.C.O.G.

Public Analyst:

J. F. CLARK, M.Sc., D.I.C., F.R.I.C.

Chief Sanitary Inspector:

W. ROBSON, M.S.I.A. (to 31st August).
W. H. WATTLEWORTH, F.R.SAN.I.,
M.R.I.P.H.H., M.S.I.A. (from 1st Sep-
tember).

District Sanitary Inspectors:

J. M. CANGLEY.
S. HESKETH (Meat & Foods Inspector).
W. E. LEATHER.
W. J. MASON.
G. B. OWENS.

Municipal Midwives:

MRS. E. H. HOY (Superintendent).
MRS. E. C. BARTLETT.
MRS. M. A. E. CHAMBERLAIN.
MRS. W. J. GILMORE.
MRS. E. HOCKLEY.
MRS. C. K. ROBERTS.
MRS. R. SHAW.
MISS A. E. THRASH.
MISS C. WILLIAMS.

STAFF—continued.*Health Visitors:*

MISS E. BASSETT.
 MRS. V. A. BENSON.
 MRS. E. BODLEY (to 30th September).
 MISS F. M. HUGHES.
 MISS J. LYNCH.
 MISS L. W. SKINNER.
 MISS E. L. THOMAS.
 MISS E. R. WILD.

Clerks:

MR. H. A. BROWN, O.B.E. (*Chief Clerk*).
 MISS M. BROWN (*Tuberculosis Office*).
 MR. D. C. CAHILL.
 MRS. J. M. JAMES.
 MISS D. M. LATIMER.
 MRS. M. KILGOUR.
 MISS M. M. THOMPSON.
 MISS A. M. GIRVAN (*Clinic Assistant*).
 MISS D. HARRISON *do.*
 MISS G. WILLIAMS (*Dental Attendant*).
 MISS D. BERNARD *do.*

Matron, Maghull Sanatorium:

MISS I. MASTERTON.

Matron, Maternity Home:

MISS E. LEYLAND.

Matron, Formby Nursery:

MISS G. G. FLETCHER.

Matron, Home Nursing Service:

MRS. H. M. CAMERON (to 31st August).
 MISS E. HEAYNS (from 1st September).

Matron, Hostel for the Blind:

MISS E. ALLSOP.

Mental Health Workers:

(from 27th June, 1948):

MR. J. W. HARPER
(Duly Authorised Officer).
 MISS M. M. WINKLE *do.*

Section III.

Vital Statistics

Civilian Population (Registrar-General's estimate at mid-year 1948)	...	...	...	...	...	...	...	69,530
Population at Census of 1931	...	...	...	...	...	...	...	76,770
Area in Acres (exclusive of river bed)	...	...	...	...	...	...	...	2,414
Inhabited houses (end of 1948) according to rate books	...	...	...	...	...	...	...	15,959
Uninhabited houses (end of 1948) according to rate books	...	...	...	...	...	...	...	90
Live Births—Males 864, Females 836	...	...	...	...	...	...	...	1,700
Birth Rate (per 1,000 population)	...	...	...	...	...	...	...	24·5
Still Births—Males 25, Females 27	...	...	...	...	...	...	...	52
Stillbirth Rate (per 1,000 total live and still births)	...	...	...	...	...	...	...	29·7
Total Deaths	...	...	...	...	...	...	...	734
Death Rate (per 1,000 population)	...	...	...	...	...	...	...	10·6
Maternal Mortality Rate (per 1,000 total births)	...	...	...	...	...	...	...	Nil
Number of deaths of Infants (under the age of one year)	...	...	...	...	...	...	...	92
Infant Mortality Rate (per 1,000 live births)	...	...	...	...	...	...	...	54·1
(Legitimate 53, Illegitimate 71)								
Deaths from Whooping Cough (all ages)	...	...	...	...	...	...	...	Nil
Deaths from Diarrhoea (under 2 years of age)	...	...	...	...	...	...	...	17
Death Rate from Respiratory Tuberculosis (per 1,000 population)	...	...	...	...	...	...	...	0·83
Death Rate from all forms of Tuberculosis (per 1,000 population)	...	...	...	...	...	...	...	0·92

The Rateable Value of the Borough as at April 1948 was £469,184

The estimated product of a Penny Rate for 1948-49 ... £1,857

In 1948-49 the General Rate was 19/4 in the £ (excluding Water rate and charges).

The cost of the Health Services during 1948-49 was estimated at £42,992, equivalent to a rate of 1s. 11·989d. in the £.

Section IV.

Comparison of Statistics with those of Previous Years

Population.

The Census returns from the year 1881 show the population of the Borough as follows :—

1881	...	...	...	...	...	...	27,374
1891	...	...	...	...	...	...	49,217
1901	...	...	...	...	...	...	58,556
1911	...	...	...	...	...	...	69,876
1921	...	...	...	...	...	...	76,487
1931	...	...	...	...	...	...	76,770

The Registrar-General's estimate of the civilian population at mid-year was 69,530. This estimate shows that the population of the Borough last year was some 2,920 more than in the summer of 1947, and the latest quarterly estimate of the Registrar-General gives the population as 69,690 on 31st December, 1948, this figure including members of the Merchant Navy at home and abroad.

Marriages.

The Superintendent Registrar states that the number of marriages during the year was 624.

From a total of 653 in 1938, the number of marriages rose to 891 in 1940, then dropped to 469 in 1941. This was followed by a steady rise to 662 in 1947, and the number this year shows a slight decrease.

Births.

During the year 1,700 live births were registered, representing a birth rate of 24·5 per 1,000 of the population, that for England and Wales being 17·9. There were 864 male and 836 female births. It will be noted that the birth rate is as usual well above the national rate.

BIRTH RATES, 1873-1948.

Period.	BOOTLE.		England & Wales.
	Births.	Rate per 1,000.	Rate per 1,000.
1873—1880 ...	6,846	38·6	35·4
1881—1890 ...	15,508	36·8	32·4
1891—1900 ...	17,716	33·2	29·9
1901—1910 ...	20,468	32·3	27·2
1911—1920 ...	20,748	27·6	21·8
1921—1930 ...	18,884	22·8	18·4
1931—1935 ...	8,367	21·8	15·0
1936—1940 ...	7,959	21·6	14·9
1941 ...	1,199	22·8	14·2
1942 ...	1,104	23·9	15·8
1943 ...	1,327	26·5	16·5
1944 ...	1,574	28·2	17·6
1945 ...	1,429	24·4	16·1
1946 ...	1,797	27·9	19·1
1947 ...	2,022	30·3	20·5
1948 ...	1,700	24·5	17·9

The illegitimate births (including stillbirths) numbered 93 and were 5·3 per cent. of the total births. In 1947 the number was 110.

Deaths.

The total number of deaths of Bootle residents during 1948 was 734, including 67 who died in institutions within the Borough and 379 who died in institutions outside the Borough, of whom 10 died in mental hospitals. This gives a total of 446 deaths in institutions, *i.e.*, 60·8 per cent. of the total deaths, as compared with 66·6 per cent. in 1947. The deaths during the year are equivalent to a death rate of 10·6 per 1,000 as compared with 13·0 per 1,000 in 1947. This is the lowest death rate ever recorded in the Borough and compares favourably with the rate of 11·6 for the 126 great towns of England and Wales.

DEATH RATES, 1873-1948.

Period.	BOOTLE.		England & Wales.
	Total Deaths.	Rate per 1,000.	Rate per 1,000.
1873—1880 ...	3,823	21·7	21·2
1881—1890 ...	8,260	19·9	19·1
1891—1900 ...	10,942	20·6	18·2
1901—1910 ...	11,400	17·8	15·4
1911—1920 ..	12,470	17·1	14·3
1921—1930 ...	10,336	13·5	12·1
1931—1935 ...	5,212	13·5	12·0
1936—1940 ...	5,019	13·8	12·5
1941 ...	1,227	23·3	12·9
1942 ...	629	13·6	11·6
1943 ...	745	14·9	12·1
1944 ...	732	13·1	11·6
1945 ...	754	12·9	11·4
1946 ...	793	12·3	11·5
1947 ...	866	13·0	12·0
1948 ...	734	10·6	10·8

COMPARATIVE MORTALITY AND BIRTH RATES.

	Death Rate all causes per 1,000 of population.	Live Birth Rate per 1,000 of population.	Infant Mortality per 1,000 live births.
BOOTLE	10·6	24·5	54·1
126 County Boroughs and Great Towns	11·6	20·0	39·0
148 Smaller Towns.. (Resident population 25,000—50,000 at 1931 Census)	10·7	19·2	32·0
England and Wales	10·8	17·9	34·0

Causes Of Deaths.

The causes of death, classified according to age, are shown in the table on page 46.

Epidemic Diseases.—Epidemic diseases accounted for 2 deaths, one death from measles, and one from diphtheria. Deaths from diarrhoea and enteritis numbered 14 as compared with 60 during 1947; all were of infants under one year.

Respiratory Diseases.—Pneumonia was responsible for 27 deaths, bronchitis for 58, and other respiratory diseases for 6, making the total deaths from respiratory diseases (excluding influenza and tuberculosis) 101. This amounts to 13·8 per cent. of the total deaths at all ages, as compared with 14·6 per cent. in 1947. Influenza was recorded as a cause of death in one case.

Cancer.—Cancer was registered as the cause of death in 116 cases, as compared with 127 in the preceding year. This represents a cancer death-rate of 1·7 per 1,000 of the population as compared with 1·91 during the year 1947.

Violent Causes.—There were 26 deaths from violent causes and 6 from suicide.

Neo-Natal Mortality.—Forty-five children died before reaching the age of one month, of whom twenty-seven died during the first week of life. This gives a neo-natal mortality rate of 26·5 per 1,000 births. Prematurity was responsible for 23 of the neo-natal deaths.

Infant Mortality.—There were 92 deaths of infants under the age of one year, compared with 185 in 1947. The infant mortality rate was 54·1 per 1,000 births, compared with 91·5 in 1947, and 78·0 in the decennium 1938 to 1947.

The rate of infant mortality amongst males was 60·2 and amongst females 48. Throughout England and Wales the rate of infant mortality was 34 per 1,000 births, and in the 126 Great Towns it was 39.

The most important of the causes of infant death were: Bronchitis and pneumonia 95, premature birth 23, congenital malformations, birth injuries and diseases peculiar to infancy 19, diarrhoea and enteritis 14.

The rate of infant mortality among legitimate infants was 53·2 and among illegitimate infants it was 71·4.

The respiratory diseases, bronchitis and pneumonia, were responsible for the largest group of infant deaths.

INFANT MORTALITY RATE—BOOTLE COMPARED WITH ENGLAND AND WALES.

Years.	BOOTLE.	England & Wales.
1901-05	166	138
1906-10	130	117
1911-15	133	110
1916-20	103	91
1921-25	91	76
1926-30	89	68
1931-35	87	62
1936-40	74	55
1941	108	59
1942	72	49
1943	76	49
1944	61	46
1945	69	46
1946	75	43
1947	91·5	41
1948	54·1	34

A tabular statement of the causes of death of children under the age of one year is given on page 47.

In view of the extremely high infant mortality rate in 1947, the Health Committee requested the Medical Officer of Health to investigate the causes of the considerable increase, and an account of these investigation is included in a separate report.

Deaths of Children aged 1-5 years.—There were 19 deaths of children aged 1 to 5 years, as compared with 30 in 1947. The principal causes were tuberculous meningitis 3, broncho-pneumonia 2, meningitis 2, congenital defects 2, and accident 4.

Inquests.—Inquests were held on 47 deaths.

Section V.

Services Provided Under Part III of the National Health Service Act, 1946.

Care of Mothers and Young Children.

Notification of Births.

The number of births notified under Section 203 of the Public Health Act, 1936, was 1,692 live births and 40 still births.

Care of Premature Infants.

Notification is made in cases where the birth weight is 5½lb. or less. In such cases every effort is made to secure a separate bedroom for mother and infant, and to provide a draught-proof cot with detachable lining, suitable bedding, hot water bottles and special feeding bottles; if any of the latter requirements are not available they are provided on loan from the Health Department.

On notification of a premature birth occurring at home, a Medical Officer of the Department communicates with the doctor in attendance, and if necessary visits the home to discuss the position with the doctor and the Midwife. Before the Midwife relinquishes responsibility arrangements are made for the Health Visitor for the district to take over early supervision.

The following notifications of premature births to mothers ordinarily resident in the Borough were received:—

In Borough—	BIRTHS.				Period		Period		Total.
					1/1/48 to 4/7/48.	...	5/7/48 to 31/12/48.	...	
(a) Home	2	...	5	...	7
(b) Maternity Homes	—	...	6	...	6
<i>Outside Borough—</i>									
(a) Walton Hospital	22	...	24	...	46
(b) Liverpool Maternity Hospital	9	...	4	...	13
(c) Other Hospitals and Nursing Homes...	6	...	1	...	7
					39		40		79

Public Health (Ophthalmia Neonatorum) Regulations, 1926 to 1937.

One case of ophthalmia neonatorum was notified during the year; the vision was unimpaired.

Infant Welfare Clinics.

Five infant clinic sessions were conducted weekly throughout the year.

INFANT WELFARE CLINICS.

Clinic.	New Cases.			Attendances.				
	Under one year.	One to five years.	Total.	Under one year.	One to five years.	Total.	No. of Sessions	Average attendance at clinic.
<i>Health Centre—</i>								
Monday afternoon ..	217	24	241	2156	396	2552	48	53.2
Wednesday afternoon	269	41	310	2475	485	2960	52	57.0
Thursday afternoon .	169	13	182	1990	264	2244	52	43.2
<i>School Medical Offices—</i>								
Tuesday afternoon ..	261	29	290	3026	359	3385	52	65.1
Thursday afternoon..	187	22	209	1556	147	1703	52	32.7
Totals { Full Year	1163	129	1232	11203	1641	12844	256	50.2
{ 5/7/48—								
{ 31/12/48	486	56	542	5221	722	5943	128	46.4

Supply of Cod Liver Oil and Fruit Juices.

The scheme of the Ministry of Food for distribution of fruit juices and cod liver oil to mothers and young children was continued during the year, and this valuable supplement to the vitamin content of their diet is now available to all expectant mothers and to children up to the age of five years.

Issues of vitamin products to infants and expectant mothers through the Council's clinics and Nursery Classes were as follows:—

	<i>Free.</i>	<i>Sold.</i>
Cod Liver Oil (bottles)	17,433	—
Cod Liver Oil Tablets (packets) ...	4,590	—
Orange Juice (bottles)	2,771	42,556

Residential Nursery, Formby.

This Residential Nursery, which was opened on 5th December, 1945, for the reception of twenty-two infants, has continued its valuable contribution to the maternity and child welfare service in that it has accommodated the infants of mothers who are in hospital or maternity home, or whose economic status makes it necessary for the child to be temporarily cared for away from home.

During the year 93 children were admitted, 97 were discharged, and 13 were in residence on 31st December, 1948. The admissions included 48 children below the age of two years, and 45 children between the ages of two and five years. Of those discharged during the year 62 had a stay not exceeding five weeks, 26 remained for 5—10 weeks, 2 for 10—15 weeks, 4 for 15—30 weeks, and 3 remained for longer periods.

Of the admissions during the year 65 were in respect of the mother's confinement, 18 in respect of the mother's illness, 2 on account of the necessity for unmarried mothers to work, and 8 because of other social or economic difficulties.

The Nursery is a training centre for the Certificate of the National Nursery Examination Board, and seven nursery students are engaged on the two years' course of training; two students obtained the certificate during the year.

On the 17th December the Home Office intimated that one of their Inspectors, following a recent visit, had reported that her general impression was that this Nursery was one of the happiest which she had ever seen, and that the Secretary of State considered that the Matron and staff were to be congratulated on their achievement at this Nursery.

Litherland Day Nursery.

One Bootle child was accommodated at the Lancashire County Council's Day Nursery at Litherland as a special case, for which the Maternity and Child Welfare Sub-Committee accepted financial responsibility.

Convalescent Home Provision.

During the year 15 children under five years of age and 204 children over that age were sent to convalescent homes.

Child Life Protection.

The Health Visitors carry out the supervision of children under the age of 9 years received for reward in pursuance of the Council's duties under the Public Health Act, 1936. Seven such children were on the register at 31st December, 1948.

Care of Illegitimate Children.

Special arrangements for the care of illegitimate children have been operating for some years. One of the Health Visitors is responsible for taking such action as is possible in the interests of the unmarried mother and her child.

Seventy-seven cases were dealt with; these came to the notice of the Department from the following sources:—

Before Confinement—

Moral Welfare Agencies	...	...	...	7	
Walton Hospital	...	...	...	5	
Ante-natal clinics	...	...	...	19	
Municipal Midwives	...	...	...	10	
Health Visitors	...	...	...	9	
Probation Officer	...	...	...	2	
Mothers' own application	...	...	...	4	
					56
<i>Birth Notifications</i>	...	...	...	...	21
					77

The work done in this connection comprised 1,897 visits to homes, 176 office interviews and 11 visits to Institutions.

Three of the unmarried mothers were admitted to Homes of the Moral Welfare Agencies at the expense of the Corporation.

The final disposal of the infants was as follows:—

Remained with mother	...	...	...	...	55
Legal adoption	...	...	...	...	5
Adoption order refused	...	...	...	...	1
Admitted to Institutions	...	...	...	...	2
Removed from district, or death	...	...	...	...	10
Pending	...	...	...	...	4

The Liverpool Child Welfare Association.

Representatives of this Association have attended clinics at the School Medical Offices on five mornings weekly to undertake on behalf of the Council arrangements for the supply and fitting of orthopaedic appliances prescribed by the medical staff, and the provision of clothing, fireguards and convalescent home treatment. During the year the Association dealt with 473 new cases (64 children under 5 years and 409 school children); 219 children were sent to Convalescent Homes, with an average stay for 15 children under five of 40·5 days and for 204 over five years of 32·4 days.

The staff paid 2,104 home visits and the clinic interviews totalled 1,490.

Municipal Midwifery Service.

Notification of Intention to Practise.

Forty-eight midwives gave notice during the year of their intention to practise midwifery in the Borough; 11 of these were municipal midwives, 28 were engaged in Liverpool Hospitals, 2 in private Nursing Homes and 7 in the Bootle Maternity Home.

Cases attended by Municipal Midwives.

	Period 1/1/48 to 4/7/48.		Period 5/7/48 to 31/12/48.		Total.
Cases attended (a) as midwife	...	334	...	284	618
(b) as maternity nurse	23	...	47	...	70
Home Visits (ante-natal)	...	...	...	...	1,748
„ „ (puerperium)	...	...	...	...	11,696

Of the total of 1,752 births to Bootle mothers the municipal midwives attended 681 births (38·7 per cent.), and the remaining births took place in the following institutions:—

Walton Hospital	...	...	...	499
Liverpool Maternity Hospital	...	...	...	99
Bootle Maternity Home	...	...	...	255
Nursing Homes	...	...	...	143
Other hospitals	...	...	...	75

(These figures include 52 stillbirths.)

Patients engage the services of the midwife nearest to their own homes, and the midwife is responsible for their ante-natal care from the date of booking.

Medical Aid.

The services of a medical practitioner were requested in 344 maternity cases during the year (227 to 4th July, 117 from 5th July), and the Local Authority paid the fees of the practitioners, recovering from the patient according to ability to pay until the inception of the National Health Service on 5th July.

Transport.

The Superintendent Midwife receives a car allowance of £25 per annum, and one of the domiciliary midwives a car allowance of £15 per annum. Those municipal midwives who possess a bicycle receive an allowance of 7/6 per month. During the night, if public service vehicles are not available, transport is provided from the Ambulance Depot, and if a vehicle is not available from the Depot the midwives hire a taxi.

Maternity Home.

The municipal Maternity Home remained under the control of the Health Committee until 4th July, and up to this date 145 cases were admitted. As from the 5th July the home was transferred to the Regional Hospital Board.

Health Visiting.*Home Visitation.*

The staff paid 16,289 home visits, including 7,449 visits to infants under one year, and 7,033 visits to children aged from one to five years.

Home Visits to Expectant Mothers.

The Health Visitors paid 750 home visits to expectant mothers to advise them on general and personal hygiene, with a view to promoting normal childbirth.

Staff.

The establishment provides for one Superintendent Nursing Officer and twelve full-time health visitors, of whom one is mainly responsible for the care of unmarried mothers and their children. During the year eight health visitors were employed, and it has not been possible to maintain a full staff.

Because of the difficulty in obtaining health visitors, the Committee in November approved of a scheme for the engagement of student health visitors who would attend a whole-time course of training at the Liverpool University School of Hygiene and would receive during the first year half the minimum salary laid down for health visitors in the Rushcliffe Report. After the period of training they would return to the service of the Authority for the remainder of the twelve months, and if successful in obtaining the Health Visitor's Certificate would, if required, give a further twelve months' service to the Authority.

Home Nursing.

Prior to 5th July a home nursing service was provided by the Bootle District Nursing Association, and by agreement with the Association the services of the district nurses were available for home visits at the request of the Medical Officer of Health.

From 5th July the Local Health Authority undertook the provision of a Home Nursing Service, and the staff of the Bootle District Nursing Association, consisting of the Matron, one other State Registered Nurse and two Enrolled Assistant Nurses, was transferred to the Authority. The service was operated from the District Nurses' Home belonging to the Association, pending arrangements being made for the acquisition of these or other premises by the Local Health Authority.

Prior to 5th July, 7,338 visits were paid to 258 patients, and from 5th July, 9,370 visits to 366 patients.

Staff.

On 31st August Mrs. H. M. Cameron, the Matron, resigned owing to ill-health, and Miss E. Heayns was appointed on 1st September.

Transport.

The Home Nurses are granted a cycle allowance of 7/6 per month.

Vaccination and Immunisation.

Vaccination.

Up to and including 4th July, 734 successful primary vaccinations and one successful re-vaccination were performed by the Public Vaccinators.

From 5th July vaccination ceased to be compulsory but continued to be carried out by general practitioners and by the Local Health Authority's medical staff. From this date the numbers dealt with were as follows :—

	Period 5/7/48—31/12/48.		
By general practitioners	156
By Local Health Authority's staff	182

Immunisation.

During 1932 a scheme was inaugurated whereby a specific clinic appointment for immunisation against diphtheria is made to parents when their children reach the age of nine months. During the year a total of 1,399 children completed the series of inoculations (579 from 1st January until 4th July, and 820 from 5th July to 31st December). This compares with 1,322 children inoculated in 1947, and makes, with those inoculated in preceding years, a grand total of 18,111. A reinforcing inoculation was given to 588 previously inoculated children on their reaching school age. The present position is that 60·3 per cent. of children under five years of age, and 67·9 per cent. of children between the ages of five and fifteen years have been protected against this disease.

The following table shows the number of children completing the series of inoculations since the inauguration of the scheme.

Age at date of inoculation.	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	Total.
Under one year	—	—	—	1	—	1	3	3	2	1	4	4	48	53	94	554	679	Under five years — 4541
1-2 years	6	5	36	34	31	32	46	44	43	45	196	314	459	720	649	417	320	
2-3 "	12	11	39	75	40	48	46	46	46	64	239	250	157	154	81	48	50	
3-4 "	15	22	62	70	47	46	33	49	29	108	208	156	74	91	60	36	42	
4-5 "	18	28	43	55	46	35	33	37	22	76	209	193	100	52	64	37	36	
5-6 "	142	242	311	279	278	191	334	66	15	213	405	338	221	211	352	187	206	5-10 years — 4516
6-7 "	237	224	194	267	232	261	190	199	4	440	290	135	71	57	79	38	56	
7-8 "	45	242	35	40	21	40	23	10	6	115	135	56	16	11	10	1	2	
8-9 "	4	62	12	10	14	12	9	7	3	44	101	52	9	6	5	—	—	
9-10 "	2	20	9	6	4	3	1	6	—	28	52	41	5	5	4	1	4	
10-11 "	1	1	3	10	7	4	4	1	1	45	90	52	4	2	5	1	1	10-15 years — 3681
11-12 "	—	2	5	10	4	1	4	4	1	50	56	45	3	2	3	2	—	
12-13 "	—	1	1	4	7	2	—	1	—	38	80	38	—	3	6	—	1	
13-14 "	—	—	3	2	4	—	1	—	—	36	96	22	4	—	2	—	1	
14-15 "	—	—	1	—	1	—	—	—	—	30	58	15	—	—	1	—	—	
15 years & over	—	—	—	—	—	—	—	—	—	—	28	2	1	—	4	—	1	4977
Age not known	100	120	19	2	76	29	20	5	—	9	13	—	—	2	1	—	—	396
TOTALS	582	980	773	865	812	705	747	478	172	1342	2260	1713	1172	1369	1420	1322	1399	18,111

Parents are advised that immunisation can be carried out either by their own doctor or by the Local Health Authority's medical staff.

Ambulance Service.

The Ambulance Service has been under the control of the Health Committee since 15th December, 1944. During the year it was operated by one supervisor and seven male driver-attendants working one team in eight-hourly shifts.

Prior to 5th July the number of calls on the service was as follows:—

		Day 7 a.m.—11 p.m.		Night 11 p.m.—7 a.m.	
Hospital Transfers	... ..	46	...	26	
Accidents (a) Docks	... ..	258	...	31	
(b) Elsewhere	... ..	192	...	27	
Sickness and Maternity	... ..	63	...	15	
Removals on behalf of Merseyside					
Hospitals Council	... ..	185	...	34	
Removals on behalf of Crosby					
Borough Council	... ..	8	...	—	
Others unclassified	... ..	26	...	6	
		<hr/>		<hr/>	
Total		778	...	139	
		<hr/>		<hr/>	

From 5th July the number of cases dealt with was as follows:—

		Day 7 a.m.—11 p.m.		Night 11 p.m.—7 a.m.	
Hospital Transfers	... ..	754	...	35	
Accidents (a) Docks	... ..	193	...	24	
(b) Elsewhere	... ..	132	...	22	
Sickness and Maternity	... ..	115	...	54	
Removals on behalf of Merseyside					
Hospitals Council	... ..	7	...	3	
Removals on behalf of Crosby					
Borough Council	... ..	8	...	2	
Others unclassified	... ..	37	...	7	
		<hr/>		<hr/>	
		1,246	...	147	
		<hr/>		<hr/>	

As from the appointed day the Service remained under the direct control of the Health Committee. In addition arrangements were made for the Liverpool Corporation to remove cases of infectious disease.

tuberculosis, and mental illness, together with cases of general sickness and maternity for admission to hospitals formerly belonging to Liverpool City Council. Arrangements were also made with the Merseyside Hospitals Council for the removal of cases of general sickness or maternity to hospitals formerly voluntary hospitals. Agreements were entered into with the Liverpool Corporation and Crosby Borough Council for mutual aid in cases of emergency.

In October the Committee considered a report by the Medical Officer of Health drawing attention to the unsatisfactory state of the Ambulance Service due to inadequate staff and worn-out vehicles, and it was decided to increase the number of male driver-attendants from 7 to 14, and to obtain two new vehicles. The resolution was, however, not approved by the Council, and a sub-committee was set up to discuss the operation of the Ambulance Service, and the question as to whether the service should be operated by the Fire Brigade on behalf of the Health Committee.

Prevention of Illness (Care and After Care)

Tuberculosis.

The Health Committee has appointed a Care Sub-Committee to deal with the special problems of tuberculous patients in the home. In addition to the visits paid by the Tuberculosis Visitor, visits to the homes of tuberculous patients are paid by Health Visitors and assistance is given in providing nursing requisites, sputum flasks, etc. Where the housing accommodation is overcrowded or unsuitable, representations are made by the Medical Officer of Health to the Housing Committee so that priority can be given to such cases.

Mental Illness or Defectiveness.

Two whole-time mental health workers are engaged, and from 5th July they made 11 pre-care and 73 after-care visits.

There is no Occupation Centre in Bootle for mental defectives, but eight defectives attend the Centre at Waterloo by arrangement with the Lancashire County Council, and one attends a Liverpool Centre by arrangement with the Liverpool City Council. Such a centre in the Borough would be a great boon to parents of defective children, and the Health Committee informed the Finance Committee that they were considering the use of the Cyprus Grove premises, formerly the Offices of the Public Assistance Committee, as an Occupation Centre for Mental Defectives.

Provision of Sick-Room Equipment

Articles of sick-room equipment are stored at the headquarters of the Home Nursing Service and are issued on loan. A deposit is requested and is refunded when the articles are returned in good condition.

Health Education.

Every opportunity is taken at the Clinics to educate mothers and children in the prevention of sickness, and leaflets and posters issued by the Central Council for Health Education are used for this purpose.

Convalescence.

The proposals of the Council under section 22 of the National Health Service Act provided for convalescent home treatment for expectant and nursing mothers and children who had not attained the age of five years. No provision was made for convalescent home treatment for patients not falling within either of these categories, and the Authority therefore requested the approval of the Ministry of Health to amend their proposals under section 28 of the Act to enable them to provide facilities for convalescence not involving medical treatment for cases not already covered by the proposals.

Domestic Help Service.

Staff.

The proposals under this section provided for five whole-time workers, but owing to the increasing demands on the service the Authority obtained the approval of the Ministry of Health in October to increase the staff to ten whole-time workers and such further numbers as might be found necessary to meet the demand. At the end of the year the staff consisted of the supervisor and the equivalent of twelve full-time workers.

The cases dealt with were as follows:—

		Cases.	Hours Worked.
1/1/48—4/7/48	... ..	89	... 6,995
5/7/48—31/12/48	... ..	144	... 11,213
		<hr/>	<hr/>
Total ...		233	... 18,208
		<hr/>	<hr/>

Section VI.

Mental Health Service

In accordance with the provisions of Section 49 of the National Health Service Act, 1946, the Bootle County Borough Council became responsible as from the 5th July, 1948, for carrying out the functions of a Local Health Authority under the Lunacy, Mental Treatment and Mental Deficiency Acts, as amended by the National Health Service Act, 1946, and the Regulations made under those Statutes. The Local Health Authority's proposals under this section, as approved by the Minister of Health, were set out in the Annual Report of the Medical Officer of Health for 1947.

The duties formerly carried out by Relieving Officers with regard to the initial disposal and care of patients of unsound mind under the Lunacy and Mental Treatment Acts are now assigned to Duly Authorised Officers of the Local Health Authority. The responsibility for providing institutional accommodation rests with the Liverpool Regional Hospital Board.

Domiciliary mental health services of the Local Health Authority are administered by the Mental Health Sub-Committee and comprise

- (a) the ascertaining of cases of mental illness and mental defectiveness;
- (b) the voluntary and statutory supervision and guardianship of mental defectives in the community;
- (c) the obtaining of Detention Orders and the making of arrangements for the admission of voluntary patients, mental defectives and persons of unsound mind into mental hospitals;
- (d) the welfare in the community of persons suffering from mental illness or defectiveness, and particularly the provision of after-care for persons discharged from mental hospitals and certified institutions.

Details of the service are as follows:—

1. Administration.

The Mental Health Sub-Committee consists of 7 members, 4 being elected members of the Health Committee, 1 a co-opted member of the Health Committee, together with 2 members nominated by the West Lancashire Mental Welfare Association.

Meetings were held monthly, the first on 11th September.

- (a) *Staff*.—The medical direction of the service is the responsibility of the Medical Officer of Health, who will be advised in the organisation and control of the service by a part-time specialist medical officer, with experience in both mental illness and mental defectiveness. This officer will be appointed by the Liverpool City Council, with whom arrangements have been made for the joint user of his services.

Two mental workers have been appointed, one male and one female, and these have been designated “Duly Authorised Officers.”

- (b) *Co-ordination with Regional Hospital Board and Hospital Management Committee*.—It is proposed that by arrangement with the Liverpool Regional Hospital Board, the services of one or more specialist medical officers will be available in a consultative capacity in connection with the ascertainment of mental defectives.
- (c) No duties have been delegated to voluntary associations.
- (d) Prior to the appointed day the Duly Authorised Officers attended a course of training in Liverpool, arranged by the National Association for Mental Health.

2. Account of Work undertaken in the Community.

- (a) *National Health Service Act, 1946, Sec. 28: Prevention (Care and After Care)*.—Since 5th July, 11 pre-care and 73 after-care visits were made.
- (b) *Lunacy and Mental Treatment Acts, 1890-1930*.—Under the Lunacy Act, 1890, as amended by the National Health Service Act, 1946, 31 cases were removed to Smithdown Road Hospital, 3 cases of senile dementia were admitted to Kirkdale Homes, and one case of senile dementia to Belmont Road Hospital.
- (c) *Mental Deficiency Acts, 1913-38*.
- (i) Under these Acts 13 cases were ascertained and found subject to be dealt with. There are 10 cases awaiting vacancies in institutions.
 - (ii) Forty-one visits were made to guardianship cases and 308 to voluntary and statutory supervision cases. One Justice's Order was obtained on petition placing a patient under guardianship and one varying order obtained transferring a case to another guardian. One case under supervision was removed to an institution under section 8 of the Mental Deficiency Act.
 - (iii) *Training*.—By arrangement with the Lancashire County Council eight cases under supervision attended the Occupation Centre at Olive Hall, Waterloo, and one attended a Liverpool Centre.

Section VII.

Dental Treatment of Expectant and Nursing Mothers and Young Children

The following report has been supplied by the Senior Dental Officer:—

(i) *Details of all forms of Dental Treatment.*

JANUARY 1ST TO JULY 4TH, 1948.

Form of Treatment.	Expectant Mothers.	Nursing Mothers.	Children under five.
Extractions	550	73	73
Fillings	—	—	—
Orthodontic Treatment	—	—	—
Dentures supplied	13	74	—
Anaesthetics given	93	73	42

JULY 5TH TO DECEMBER 31ST, 1948.

Extractions	450	144	93
Fillings	—	—	—
Orthodontic Treatment	—	—	—
Dentures supplied	15	62	—
Anaesthetics given	110	36	55

(ii) *Number of Patients dealt with.*

JANUARY 1ST TO JULY 4TH, 1948.

	Expectant Mothers.	Nursing Mothers.	Children under five.
Number examined	80	21	94
Number needing treatment..	99	22	56
Number treated	74	10	68
Number made dentally fit ...	92	17	68

JULY 5TH TO DECEMBER 31ST, 1948.

Number examined	50	10	22
Number needing treatment..	42	8	40
Number treated	36	10	28
Number made dentally fit ...	23	13	28

(iii) No specialist clinical research is undertaken, but advice is given to each patient regarding the maintenance and improvement of dental health.

Section VIII.

Infectious Diseases

The number of cases of infectious disease notified during the year is summarised as follows:—

				Cases notified.	Cases admitted to hospital.	Deaths.
Enteric Fever	...	...	...	2	2	—
Scarlet Fever	...	...	...	211 (7)	142	—
Diphtheria	...	...	...	58 (48)	57	1
Ophthalmia Neonatorum	...	...	...	1	—	—
Erysipelas	...	...	...	18 (1)	5	—
Measles	...	...	...	572 (1)	32	1
Whooping Cough	...	...	...	128 (1)	8	—
Infant Diarrhoea (under two years)						
voluntarily notifiable	...	...	...	16	7	14
Acute Primary and Influenzal						
Pneumonia	...	...	...	76	48	37
Cerebro-Spinal Meningitis	...	...	...	12 (5)	11	2
Malaria	...	...	...	1	1	—
Dysentery	...	...	...	5 (3)	5	—
Acute Poliomyelitis	...	...	...	2 (1)	2	—
*Tuberculosis—						
(a) Pulmonary	...	...	...	137	—	56
(b) Non-Pulmonary	...	...	...	30	—	8

* Primary notifications.

(The totals in brackets give number of cases where diagnosis was not confirmed.)

Diphtheria—Death of an Immunised Child.

The death from diphtheria referred to in the above table occurred on 22nd December, 1948, and was of a child aged 15 months who had been inoculated on 6th July and 3rd August, 1948, with 0·2 ml. and 0·5 ml. A.P.T. on these dates respectively.

On learning of the death of this immunised child I approached the Superintendent of the infectious diseases hospital in which the child died for information as to any post mortem examination and bacteriological tests, especially virulence tests, which might have been carried out. I was informed that the only examination carried out was a dissection of as much of the trachea as could be seen through the wound through which the operation of tracheotomy had been done shortly before death, and that there seemed to be definite membrane present. It was stated that no bacteriological examination of any kind was carried out, and the Superintendent admitted that he was unable to give a definite diagnosis.

I felt that the evidence in support of the death having been due to diphtheria was inadequate, particularly in view of the recent prophylactic inoculation, and that a diagnosis of acute laryngitis was more appropriate. I wrote to the Registrar-General requesting that consideration be given to the matter of altering the diagnosis, but the Registrar-General replied stating that he was not prepared to assign the death to a cause other than diphtheria.

Enteric Fever.

One case of typhoid fever was notified, but the hospital authority was unable to confirm the diagnosis.

The other case of enteric fever was one of paratyphoid B.

Section IX.

Tuberculosis

Notification Register.—The register on 31st December, 1948, included 220 males and 235 females suffering from pulmonary tuberculosis, and 47 males and 81 females suffering from non-pulmonary tuberculosis, making a total of 583 cases as compared with 575 at the end of 1947.

Incidence.—The number of new cases notified during the year under the Public Health (Tuberculosis) Regulations, 1930, was 167 (137 pulmonary and 30 non-pulmonary).

Notifications during recent years were as follows:—

Year.						Tuberculosis Notifications.
1940	...	...	...	...	...	150
1941	...	...	...	...	...	142
1942	...	...	...	...	...	169
1943	...	...	...	...	...	186
1944	...	...	...	...	...	162
1945	...	...	...	...	...	173
1946	...	...	...	...	...	190
1947	...	...	...	...	...	152

Mortality.—The number of deaths caused by tuberculosis during the year was 64 amounting to 8.72 per cent. of the deaths from all causes and giving a death-rate from this cause of 0.92 per 1,000 of the population, the same rate as last year.

DEATHS FROM TUBERCULOSIS.

Period.	BOOTLE.		England & Wales.
	No. of Deaths.	Rate per 1,000.	Rate per 1,000.
1891-1900 ...	1106	2.17	2.01
1901-1910 ...	1127	1.76	1.65
1911-1920 ..	1370	1.82	1.42
1921-1925 ..	652	1.70	1.08
1926-1930 ..	572	1.49	0.94
1931-1935 ...	537	1.39	0.81
1936-1940 .	411	1.12	0.67
1941 ..	85	1.62	0.73
1942 ..	63	1.37	0.65
1943 ...	64	1.28	0.67
1944 ..	64	1.14	0.63
1945 ...	59	1.01	0.62
1946 ...	77	1.20	0.55
1947 ...	61	0.92	0.55
1948 ...	64	0.92	0.51

Dispensary Register.—On 31st December, 1948, the number of cases receiving treatment was 490 as against 491 on 31st December, 1947.

Pulmonary Tuberculosis.

Incidence.—One hundred and thirty-seven new cases suffering from pulmonary tuberculosis were notified during 1948, an increase of 14 over the previous year. The numbers notified during the preceding five years were as follows:—

Year.	Notifications of Pulmonary Tuberculosis.					
1943	157
1944	135
1945	142
1946	161
1947	123

In three cases the first intimation was obtained from the death returns, while in 12 other cases notification was made at intervals of less than three months before death. The non-notified cases, therefore, numbered 5·4 per cent. of the total of 56 deaths from pulmonary tuberculosis.

Mortality.—During the year 56 deaths were certified to be due to pulmonary tuberculosis, representing a rate of 0·80 per 1,000 of the population, as compared with 0·81 in 1947, 1·04 in 1946, and 0·87 in 1945. There were 27 deaths among males and 29 among females.

Chest Clinic.—During the year the Tuberculosis Officer examined 358 patients newly referred, of whom 75 were sent by the School Medical Officers for opinion preliminary to notification. Attention continued to be paid to securing the attendance for examination of contacts of notified cases, and during the year 75 were so examined. The Tuberculosis Visitor made 553 visits to homes of tuberculous patients (274 during the period 1/1/48 to 4/7/48 and 279 during the period 5/7/48 to 31/12/48).

The total attendances at the Clinic during the year numbered 5,665; 3,958 visits were for examination by the Tuberculosis Officer (2,106 during the period 1/1/48 to 4/7/48 and 1,852 during the period 5/7/48 to 31/12/48); 1,707 attendances were in connection with the issue of medical certificates, applications for re-housing, maintenance allowances, etc. (1,435 during the period 1/1/48 to 4/7/48 and 272 during the period 5/7/48 to 31/12/48). Five hundred and four specimens of sputum were examined (270 during the period 1/1/48 to 4/7/48 and 234 during the period 5/7/48 to 31/12/48), giving a positive result in 71 cases (32 in the period 1/1/48 to 4/7/48 and 39 in the period 5/7/48 to 31/12/48).

Nine hundred and seventy-seven radiographic examinations were made at the Clinic during the year (494 in the period 1/1/48 to 4/7/48 and 483 during the period 5/7/48 to 31/12/48).

Maghull Sanatorium.—Up to 4th July, 1948, 13 patients were admitted to the Sanatorium, and on this date there were 13 males and 11 females in residence. From the 5th July institutional treatment for cases of tuberculosis became the responsibility of the Regional Hospital Board.

Maintenance Allowance.

Maintenance allowances under the Ministry of Health's Memorandum 266/T were granted up to 4th July, the amount disbursed being £1,592 2s. 6d. In addition special payments were made for the provision of pocket money to patients in sanatoria, and with these and other allowances the total expenditure was £1,649 2s. 6d.

Non-Pulmonary Tuberculosis.

During the year 30 new cases of non-pulmonary tuberculosis were notified, as compared with 29 in 1947, namely:—8 bones and joints, 10 glands, 9 meninges, and 3 other sites.

The agreement with the Leasowe Hospital for the maintenance of beds for children suffering from non-pulmonary tuberculosis remained in force up to 4th July. At the beginning of the year 8 cases were in hospital, and up to the 4th July one further case was admitted and 5 discharged. From the 5th July the hospital was transferred to the Regional Hospital Board.

The scheme for admission to general or special hospitals of cases of non-pulmonary tuberculosis, and for payment by the Council of the charges for maintenance and treatment in cases recommended or approved by the Tuberculosis Officer, was continued up to 4th July; two such patients were admitted.

Public Health (Prevention of Tuberculosis) Regulations, 1925—No action was taken under the above Regulations relating to tuberculous employees in the milk trade.

Public Health Act, 1936: Section 172.—No action was taken under this Section dealing with the compulsory removal of cases of tuberculosis to hospital.

Section X.

Venereal Diseases

The Council's scheme for the treatment and control of Venereal Diseases remained in operation until the 4th July.

The Annual Statistical Report of the Medical Officer of the Treatment Centre shows 590 persons under treatment on 31st December, 1948, as against 639 on 1st January, 1948, and a slight decrease in new cases, the figure being 436, as contrasted with 450 in 1947. The total of 436 included 196 cases in which the diagnosis of venereal disease was not established, and there was in fact a further decrease in the new cases of gonorrhoea.

The total attendances for treatment made at the Centre during the year show a decrease from 8,262 to 6,980; the figure includes 753 attendances made between clinic days for the treatment of gonorrhoea at the irrigation centre. The average attendance at the male clinics was 25, and at the female clinics 11. During 1948, 276 cases were discharged on completion of treatment and observation, as against 250 in the previous year.

The following table is a statement of the number of cases presenting themselves for treatment during the last six years:—

BOOTLE VENEREAL DISEASES CLINIC.

	1943	1944	1945	1946	1947	1948
New Cases (total)	379	421	433	356	450	436
New Cases (syphilis)	104	89	84	94	92	75
New Cases (gonorrhoea)	113	117	206	249	186	162
Total attendances (excluding Irrigation Department)	9167	9407	8847	8786	7791	6227
Irrigation Department attendances	3269	2261	1713	793	561	753
In-patient Days	176	178	106	140	104	22
No. discharged after completion of observation and treatment	97	198	212	270	250	276
No. who ceased to attend after completion of treatment, but before final tests as to cure	1	1	11	44	135	87

Bootle residents accounted for 36.6 per cent. of the new cases under treatment at the Bootle Hospital Centre, the Authorities contributing the next largest number of cases being Liverpool with 23.6 per cent. and Lancashire County Council with 23.4 per cent.

From the 5th July the Venereal Diseases service became the responsibility of the Regional Hospital Board.

Section XI.

Housing

The provision of adequate housing accommodation remains one of the most pressing needs of the Borough. The following information relating to applications for the tenancy of Corporation houses up to 31st December, 1948, has been supplied by the Housing Manager.

No. of applicants living in rooms inside the Borough ...	1793
do. outside do. ...	492
<hr/>	
Total No. of applicants living in rooms ...	2285
<hr/>	
No. of applicants who are householders inside the Borough ...	694
do. outside do. ...	243
<hr/>	
Total No. of applicants who are householders ...	937
<hr/>	
Total No. of applicants ...	3222
<hr/>	

The reduction in the numbers of applicants since the 31st December, 1947, is due to the revision of all applications carried out by the Housing Department early in the year according to the instructions of the Ministry of Health to all local authorities.

Of the non-householder applicants at present on the list 84 per cent. have not more than two children. Applications are mainly from young married couples.

The Borough Engineer has supplied the following information relating to houses erected during the year:—

Houses erected by Local Authority—A.3 Type ...	43
A.2 Type Flats ...	4
A.1 do. do. ...	12
<hr/>	
„ „ „ other bodies and persons ...	8
„ „ „ Ministry of Works (temporary bungalows) ...	245

Six houses were demolished during the year by the Local Authority, and 11 by other bodies and persons.

Section XII.

Miscellaneous

Cancer Scheme.

The interim proposals of the Council under the Cancer Act, 1939, were outlined in the Annual Report for 1945.

Under these arrangements 40 persons received in-patient treatment and 145 persons received out-patient treatment at voluntary hospitals during the period 1st January to 4th July, 1948, at net costs of £433 13s. 3d. and £150 14s. 3d. respectively. In addition, 86 in-patients were treated at municipal hospitals.

As from the 5th July, the cancer service became the responsibility of the Regional Hospital Board.

Poor Relief.

The National Assistance Act, 1948, came into force on the 5th July, 1948. Persons in need of financial assistance receive moneys provided by Parliament under the provisions of Part II of the Act, through the National Assistance Board.

Up to the 4th July, 1948, £20,442 was expended in Out-Door Relief, including £1,750 to unemployed persons.

The return of persons in receipt of Poor Relief on the night of the 4th July, 1948, shows 486 persons to have been in receipt of Institutional Relief, of whom 122 were not suffering from sickness, accident, or bodily or mental infirmity, and 1,127 persons to have been in receipt of Domiciliary Relief.

Medical Out-Relief.

The administration of medical out-relief remained under the control of the Public Assistance Committee, acting through the Medical Officer of Health, until 5th July, 1948, from which date the National Insurance Act, 1946, came into operation.

Up to 4th July, 1948, the weekly average was 27 surgery consultations and 4 home visits in Districts 1 and 2, and 35 surgery consultations and 9 home visits in District 3.

Blind Welfare.

As from 5th July, 1948, the administration of the Council's Blind Welfare Scheme was transferred to the newly-constituted Social Services Committee. At that date the number of blind persons on the register was 141 (72 males and 69 females).

The number of blind persons on the register at the end of the year was 145 (72 males and 73 females).

Section XIII.

Sanitary Circumstances

Water Supply.

Bootle is supplied with water by the Liverpool Corporation. The supply is obtained from upland surfaces in North Wales and Lancashire, and is delivered by gravity. It is wholesome, constant and sufficient for all purposes. Periodical bacteriological examinations are made and reports submitted. The water from the reservoirs situated at Rivington and Lake Vyrnwy is subjected to slow sand filtration and chlorination. It is free from excess acids and is without deleterious effect on metals.

Sanitary Inspection of the District.

Nuisances.—The number of nuisances for which notices were served on owners and occupiers was 7,043.

Prosecutions: Non-Abatement of Nuisances, Public Health Act, 1936: Section 93.—No prosecutions were instituted against owners in respect of abatement notices served upon them.

Fertilisers and Feeding Stuffs Act, 1926—Eight samples of feeding stuffs and eight samples of fertilisers were taken during the year.

Canal Boats.—Forty-seven inspections were made of canal boats on the section of the Leeds and Liverpool Canal within the Borough. Four notices were served and three infringements have now been remedied. No women or children were found on canal boats inspected during the year. Bootle is not a Registration Authority under the Public Health Act, 1936, section 249.

Verminous Infestation.—The routine procedure for disinfestation of verminous premises has been adopted throughout the year, 25 municipal houses and 48 privately owned houses having been disinfested with suitable insecticide. The furniture from 62 dwelling-houses was treated with Hydrogen Cyanide. Special treatment has been adopted for cockroach infestation, 68 municipal houses and 9 privately-owned houses having been disinfested during the year. The treatment has now been extended to include schools and public buildings.

Rat Infestation.

Inspection of Lands and Buildings.—The permanent staff consisting of three Rodent Operators, made 6,195 inspections of lands and buildings other than dwelling-houses, comprising food and other retail shops, factories, warehouses, schools, offices, cold stores and two refuse tips. In 111 such inspections (1·79 per cent.) the premises were found to be infested, 48 by rats and 63 by mice. The staff treated 52 of these infestations, the remainder being dealt with by servicing companies under the supervision of the Rodent Operators. The staff deposited 1,422 poison baits, of which 673 were taken and 101 bodies recovered. There were no major infestations during the year. A cold store which was reported as being a major, and later a minor, infestation by mice, has been treated systematically and is now only infested to a very slight extent.

Inspection of Private Dwellings.—The systematic inspection of private dwelling-houses was continued during the year. Visits to dwelling-houses totalled 16,441, and infestations were recorded in 94 instances, 14 by rats and 80 by mice. All were slight infestations, the rats being migrants in each case. In treating these infestations the staff laid 1,972 poison baits, of which 1,621 were taken.

Sewer Treatment.—Poison baits were laid in 2,395 man-holes during April and June, and 278 baits were taken. A second treatment was carried out in October and December, and poison baits were laid in 1,520 man-holes; 353 baits were taken. Further treatments are being carried out.

Factories Act, 1937.

The factories are visited regularly. All the staff of Inspectors have been appointed by the Local Authority to undertake the special duties laid down under the Factories Acts. The total number of factories, including bakehouses, on the register is 276, viz.:—

Factories with mechanical power	...	...	212
Factories without mechanical power	...	...	64

The Sanitary Inspectors made 458 visits to factories during routine inspections. Notices were served on owners or occupiers in 32 cases, requiring 77 defects to be remedied. Where a notice was not served, verbal information was sufficient and all the defects have now been remedied, or the work is in progress.

Outworkers.—There were 12 visits made to premises, which were all found to be satisfactory.

Bakehouses.—There are 19 bakehouses in use, one of which is a basement bakehouse and 2 of which have mechanical power. Visits to bakehouses totalled 120, and all were found to be in a very satisfactory condition.

Workplaces, including Offices.—Routine inspections have now been commenced on these premises, and a new register is being compiled.

Smoke Abatement.—This problem is causing considerable anxiety, and many difficulties are being experienced by the staff in their efforts to effect improvement. In many cases firms are hampered in their efforts to ameliorate the smoke nuisance by the present difficulty of obtaining up-to-date plant and suitable fuel.

Co-operation between factory managers and the Inspectors is being steadily developed, and stokers are being advised on the best methods of firing.

Warnings have been given to persistent offenders, and the essentially industrial character of the Borough permits of no relaxation in combating this menace to public health.

Shops, Second-hand Stores and Places of Amusement.—Routine visits are being made and new registers being compiled.

Food Hygiene.

Source of Milk Supply.—The bulk of the milk supply is brought in by road or rail, and there is now only one shippon in the Borough. The cows housed in the shippon number 21, as compared with 550 in shippons in 1914. The shippon has been visited on 33 occasions, and is in a satisfactory condition.

Dairies and Cowsheds: Milk and Dairies Regulations, 1926 to 1943.—Registrations in the Borough comprise 17 dairies or milk shops, 1 cow shed, and 65 retail purveyors of bottled milk. The cowshed, dairies and milkshops were inspected on 185 occasions and the premises found to be maintained in a satisfactory state.

Cleanliness and Safety of Milk.—The Milk (Special Designations) Orders, 1936-1943, prescribe the following designations of milk, namely:—Tuberculin Tested, Accredited, Pasteurised.

At the end of 1948, one dairyman held a licence to produce Accredited Milk, one to produce Pasteurised Milk, two were licensed dealers in Pasteurised Milk, and 14 were licensed dealers in Tuberculin Tested Milk. Bacteriological examinations of the milk supply numbered 132, such examinations not being limited to designated milks.

Milk and Tuberculosis.—There were 24 bacteriological examinations made, and no samples was found to be infected.

Pasteurised Milk.—One licence for the production of pasteurised milk was renewed, and 40 samples taken during the year. Thirty conformed in all respects to the requirements of the Ministry of Health. One hundred and three samples of pasteurised and heat-treated milk were submitted for examination by the phosphatase test, of which number 96 were satisfactory.

Preparation of Ice Cream.—In connection with the sale and manufacture for sale of ice cream, registration of persons and premises is required under the Bootle Corporation Act, 1930, section 21. Where there is any danger to the public health the local authority may refuse to register or may revoke an existing registration.

At the end of the year the registrations totalled:—

Premises—

For the manufacture for sale and sale of ice cream ...	13
For the sale only of ice cream	30

Persons—

For the manufacture for sale and sale of ice cream ...	13
For the sale only of ice cream or water ices	35

These special powers of supervision were obtained because of the necessity of ensuring the wholesomeness of milk products eaten largely by children, and during last year 202 visits of inspection were made to registered premises, and 64 samples obtained and submitted to the Methylene Blue Test in the form proposed by the Medical Research Council and recommended by the Ministry of Health. Four provisional grades are defined, viz.:—

- Grade 1: Time taken to reduce methylene blue—4 hours or more.
- Grade 2: Time taken to reduce methylene blue—2½ hours to 4 hours.
- Grade 3: Time taken to reduce methylene blue—½ to 2 hours.
- Grade 4: Time taken to reduce methylene blue—0 hours (*i.e.*, reduction at the end of the incubation period).

On submission to the Methylene Blue test, 18 samples were placed in Grade 1, 15 in Grade 2, 4 in Grade 3 and 27 in Grade 4.

The Ice Cream (Heat Treatment, etc.) Regulations, 1947, which came into partial operation on 1st, May, 1947, have improved the powers of control of this commodity. Improvements have been effected in the 13 premises in the Borough registered for the manufacture for sale of ice cream, and in one case complete reconstruction and installation of modern plant has been carried out.

It has been found that cooling apparatus is still difficult to obtain, and allowance has been made for this in the Regulations of 1947 and the amending Regulations of 1948.

It is satisfactory to report, however, that the results of the tests show a steady improvement month by month, and that all connected with this trade in the Borough have given full support to the efforts of the Department to implement the requirements of the Regulations, whether by the installation of new apparatus or by improvements in technique. As evidence of this it can be stated that of 10 samples obtained in April, 1948, and submitted to the Methylene Blue Test 8 were placed in Grade 1, 1 in Grade 2, and only 1 in Grade 4.

Meat and Other Foods.

Butchers' Shops, etc.—Supervision of food shops, bakehouses and factories continued to be exercised by the Department, the highest possible standard of materials and methods being insisted upon.

Food and Drugs Act, 1938.—The Public Analyst, to whom samples were submitted, is Mr. J. F. Clark, M.Sc., D.I.C., F.R.I.C.

During the year 227 samples were taken, of which 4 (1·7 per cent.) were found to be adulterated or not up to standard. One hundred and thirty of these were taken informally, and in cases where adulteration was detected formal samples were subsequently obtained in order that the necessary legal action might be instituted. One hundred and twenty-six samples of milk were obtained, of which 29 were taken informally; in the other 97 cases, however, the procedure prescribed by the Act was carried out. Two samples of milk (formal) were found to be adulterated. In one case the vendor was interviewed and cautioned, and a formal sample taken subsequently was found to be genuine. In the other case an "appeal to the cow" sample showed that there had been no adulteration by the vendor.

Public Health (Preservatives, etc., in Food) Regulations—One hundred and sixty-one samples, including 126 of milk, were examined under these Regulations for the presence of preservatives. All the samples were found to comply with the Regulations.

Special Samples.—Fourteen special samples were submitted for bacteriological examination, comprising 2 salmon paste, 6 meat and vegetable preparations, 3 meat and vegetable pies, 1 tin corned beef and 2 water.

Housing.

Town and Country Planning Acts, 1944 and 1947: War Damaged Areas.—Declaratory Areas 1 and 2 were surveyed and reports prepared on specimen houses for presentation at the Ministry of Health Inquiry held in October, 1948. All the houses in these areas are now being visited and detailed reports prepared on each house, in accordance with the requirements of the Town and Country Planning Acts.

Offensive Trades

There are two Tanneries in the Borough and these are being inspected regularly. A new register is being compiled.

Camping Sites.

Two sites are used regularly by members of the Showmen's Guild, and these are inspected during their period of occupation. Other sites not intended for this purpose are used from time to time by gypsies, and in such cases immediate action is taken.

Common Lodging Houses.

There are no registered common lodging houses within the Borough.

Houses Let In Lodgings.

A register is now being compiled of all houses let in lodgings.

Food Condemned.

The total amount of food condemned during the year 1948 was 17 tons, 13 cwts., 2 qrs., 25 lb.

INFANT MORTALITY, 1948—CAUSES OF DEATH.

CAUSES OF DEATH.	Total Deaths under One Year.									
	Under 1 week.	1—2 weeks.	2—3 weeks.	3—4 weeks.	Total under 4 weeks.	4 weeks and under 3 months.	3 months and under 6 months.	6 months and under 9 months.	9 months and under 12 months.	Total Deaths under One Year.
Small-pox	..	..	..	..	..	..	..	..	..	..
Chicken-pox	..	..	..	..	..	..	..	..	..	..
Measles	..	..	..	..	..	..	..	..	..	..
Scarlet Fever	..	..	..	..	..	..	..	..	..	..
Whooping Cough	..	..	..	..	..	..	..	..	..	..
Diphtheria and Croup	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	..	..
Tuberculous Meningitis	..	..	..	..	..	..	..	..	..	1
Abdominal Tuberculosis	..	..	..	..	..	..	..	..	..	..
Other Tuberculous Diseases	..	..	..	..	..	..	..	..	..	1
Meningitis (<i>not Tuberculous</i>)	..	..	..	..	..	..	..	..	..	..
Convulsions	..	..	..	..	..	..	..	..	..	..
Laryngitis	..	..	..	..	..	..	..	..	..	..
Bronchitis	..	..	..	..	..	..	..	..	..	4
Pneumonia (all forms)	2	1	2	..	5	1	2	6	1	18
Diarrhoea	..	..	..	..	..	..	..	..	..	..
Enteritis	..	..	2	1	3	1	6	2	1	13
Gastritis	..	..	..	..	..	..	..	..	..	1
Syphilis	..	..	..	..	..	..	..	..	..	..
Rickets	..	..	..	..	..	..	..	..	..	..
Suffocation, asphyxia	..	..	1	..	2	4	..	1	..	7
Injury at Birth	..	..	..	..	..	..	..	..	..	..
Atelectasis	2	..	..	..	2	3	..	..	..	6
Congenital Malformations	22	..	3	4	29	1	..	1	..	30
Premature Birth	..	..	..	..	..	2	..	..	..	3
Atrophy, Debility and Marasmus	1	..	..	1	1	2	..	2	..	7
Other Causes	2	..	..	1	3	..	..	..	..	..
Totals	30	1	8	6	45	18	12	15	2	92

INDEX

	PAGE		PAGE
A.		F.	
Ambulance Service	5, 25	Factories Act, 1937	41
Area of Borough	10	Fertilisers and Feeding Stuffs Act, 1926	40
Atmospheric Pollution	5	Food condemned	45
B.		Food Hygiene	42
Births 10, 11, 12, 13, 16		Foreword	3
Births, Illegitimate	12	Formby Residential Nursery	18
Blind Welfare Committee	7, 39	Frnit Juices	17
C.		G.	
Camping Sites	45	General Rate	10
Canal Boats	40	H.	
Cancer	14, 39	Health Committee	6
Care of Mothers and Young Child- ren	16	Health Education	27
Chest Clinic	35	Health Services, cost of	10
Child Life Protection	19	Health Visiting	21
Clerical Staff, Shortage of	4	Home Nursing	22
Cod Liver Oil	17	Houses inhabited	10
Committees, Constitution of	6, 7	Houses let in lodgings	45
Common Lodging Houses	45	Houses uninhabited	10
Comparison of Statistics	11, 13	Housing	5, 38, 45
Convalescent Home Provision	18, 27	I.	
Cost of Health Services	10	Ice Cream	43
D.		Illegitimate Children, Care of	19
Day Nursery, Litherland	18	Immunisation	23
Death Rate 1, 10, 12, 13		Immunised child, death of	31, 32
Deaths, causes of	14, 46	Infant Mortality 4, 10, 13, 14, 15, 46	
Deaths, infant	10, 47	Infant Mortality, 1947 — Special Report following p. 46	
Deaths in Institutions	12	Infant Welfare Clinics	17
Deaths from Respiratory Diseases	14	Infectious Diseases	30
Deaths from Tuberculosis	10	Inhabited houses	10
Deaths from Tuberculosis (all forms)	10	Inquests	15
Deaths from Tuberculosis (Respiratory)	10	L.	
Deaths from Whooping Cough	10	Live births	10
Deaths, total 10, 12, 13		Liverpool Child Welfare Associa- tion	20
Dental treatment	4, 30	M.	
Diarrhoea (under 2 years of age), deaths from	10	Maghull Sanatorium	35
Diphtheria, death from	31, 32	Marriages	11
Diphtheria immunisation	23	Maternal Death Rate	4, 10
Domestic Help Service	27	Maternity Home	21
Duly Authorised Officers	29	Medical Out-Relief	39
E.		Mental Health Service	26, 28
Enteric Fever	32	Milk	42
Epidemic diseases, deaths from	14	Municipal Midwifery Service	20

INDEX—continued.

N.				PAGE	S.				PAGE
National Health Service Act, 1946				3, 4, 5, 16	Sanitary Circumstances	...	...	...	40
National Smoke Abatement Society				5	Sewer Treatment	...	...	...	41
Neo-natal Mortality	...	...		14	Sickroom Equipment on loan	...	...	...	27
Notification of Births	...	...		16	Smoke Nuisance	...	...	...	5, 42
Nuisances	...	...	...	40	Staff	...	...	...	8
Nursery, Residential	...	...		18	Statistics, Comparison of	...	...	...	11
Nursing requisites on loan	...	...		27	Statistics, Vital	...	...	...	10
					Stillbirths	...	...	...	10
O.					T.				
Occupation Centre for Mental De-				26	Tuberculosis—Incidence	...	...	...	33
fectives	...	...	...	45	Tuberculosis—Maintenance Allow-				
Offensive Trades	...	...	...	17	ances	...	...	...	36
Ophthalmia Neonatorum	...	...			Tuberculosis—Mortality	10, 33, 34, 35			
P.					Tuberculosis—Non-Pulmonary	...	...	...	36
Poor Relief	...	...	...	39	Tuberculosis—Pulmonary	...	...	...	33, 34
Population	...	...	...	10, 11					
Premature Infants, Care of	...	...		16	U.				
Prevention of Illness (Care and				26	Uninhabited Houses	...	...	...	10
After-Care)	...	...	...	10					
Product of Penny Rate	...	...		36	V.				
Public Health (Prevention of Tuber-					Vaccination	...	...	...	23
culosis) Regulations, 1925	...	...			Venereal Disease	...	...	...	37
R.					Vermis Infestation	...	...	...	40
Bat Infestation	...	...	...	41	Vital Statistics	...	...	...	10
Rate, General	...	...	...	10					
Rateable Value	...	...	...	10	W.				
Residential Nursery	...	...		18	Whooping-Cough, Deaths from	...	...	...	10
Respiratory Diseases, Deaths from	...	...		11					

COUNTY BOROUGH OF BOOTLE



REPORT
ON AN
INVESTIGATION
INTO THE
INFANT MORTALITY
OF BOOTLE
DURING THE YEAR 1947.

JAMES F. SWAN,
M.D., D.R.C.O.G., D.P.H.
MEDICAL OFFICER OF HEALTH.

CONTENTS

	PAGE.
I. METHOD OF INVESTIGATION	4
(a) Comparison with other years	4
(b) Perusal of Death Returns	4
(c) House-to-house Survey	4
(d) Information obtained from other authorities and the Registrar-General's Statistical Review	4
II. RESULTS OF INVESTIGATION	5
(a) Death Returns	5
(b) House-to-house Survey	5
(i) Place of birth	5
(ii) Place of death	5
(iii) Relation of Gastro-enteritis to method of feeding	6
(iv) Health Visitors' impression of mothers' ability and aptitude as regards hygienic feeding	6
(v) Parity of mother	6
(vi) Age of mother	6
(vii) Ante-natal case	6
(viii) Maternal employment during pregnancy ...	7
(ix) Father's employment	7
(x) General standard of living	7
(xi) Housing	7
III. CONCLUSIONS	8
(a) Causes of death	8
(b) Investigation into home conditions	9
(c) Correlation of Infant Mortality Rate with Birth Rate	10
(d) Correlation of Infant Mortality Rate with Population Density	10
(e) Correlation of Infant Mortality Rate with the Intensity with which Health Visiting is carried out	11
(f) Further Consideration of the Effects of Birth Rate and Population Density on the Infant Mortality Rate	12
(g) General	13

APPENDIX

	PAGE.
Table 1. Infant Mortality Rates, Bootle and England & Wales, 1898-1948 	15
Table 2. Infant Mortality, Bootle, 1947. Causes of and Ages at Death 	16
Table 3. Infant Mortality Rates, 1947, Bootle and eighty- seven other authorities in Great Britain and Eire	17
Table 4. Correlation of Infant Mortality Rate with Birth Rate, eighty-eight local authorities in Great Britain and Eire, 1947 	18
Table 5. Correlation of Infant Mortality Rate with Population Density, eighty-eight local authorities in Great Britain and Eire, 1947 	19
Table 6. Correlation of Infant Mortality Rate with the Intensity with which Health Visiting is carried out, eighty-eight local authorities in Great Britain and Eire, 1947 	20
Table 7. Incidence of the common causes of infant deaths, Bootle, 1938-1947 	21
Table 8. Birth Rates, Bootle and England & Wales, 1898-1948	22
Figure 1. Infant Mortality Rates, Bootle and England & Wales, 1898-1947 	23
Figure 2. Infant Mortality Rates, Bootle and England & Wales, 1898-1948, smoothed by method of least squares	24
Figure 3. Birth Rates, Bootle and England & Wales, 1898-1948	25
Copy of Investigation Card used by Health Visitors	26
Copy of Investigation Card used by Sanitary Inspectors	30

Report on an Investigation into the Infant Mortality of Bootle during the year 1947

Following the publication of the Annual Report of the Medical Officer of Health for 1947, the Health Committee requested him to investigate the causes of the high infant mortality rate for that year, which at 91.5 per 1,000 live births was more than double the rate of 41.0 for England and Wales.

I. METHOD OF INVESTIGATION.

(a) *Comparison with other years.*

The infant mortality rates for Bootle and for England and Wales from 1898 to 1948 are shown in Table 1, and I have plotted these rates in Figure 1 (page 23). In Figure 2 (page 24) the individual yearly rates have been replaced by straight lines calculated by the method of least squares in order that the trends in the case of Bootle and of the country as a whole may be more easily assessed. From a study of these diagrams it is apparent that the infant mortality rate of Bootle has been consistently higher than that of the country generally, and that the rate of reduction in the Borough has been slightly less than in England and Wales.

(b) *Perusal of Death Returns.*

The infant deaths in Bootle in 1947 numbered 185, and the causes of and ages at death are given in Table 2 (page 16), which is reproduced from the Annual Report of the Medical Officer of Health for 1947.

(c) *House to House Survey.*

A special investigation card was drawn up, a copy of which is reproduced on pages 26-29. To obtain the required information, visits were paid by health visitors to the mothers of the deceased infants. A sanitary inspector also visited each house and reported on the sanitary conditions. A copy of the card used for this purpose is also reproduced on pages 30-32.

(d) *Information obtained from other authorities and the Registrar General's Statistical Review.*

I also obtained information from the Health Departments of 87 local authorities on certain aspects of their infant mortality experience in 1947 for purposes of comparison. These were mainly English County Boroughs, but a number of authorities in Scotland and Ireland were

also included. The infant mortality rates of these authorities are set out in Table 3 on page 17. A study of the Registrar-General's Statistical Review for 1947 showed that, apart from some "freak" rates occurring in areas of very small population, and based on deaths of fewer than 20 infants, Bootle had the highest infant mortality rate of any local authority in England and Wales for that year.

II. RESULTS OF INVESTIGATION.

(a) *Death Returns.*

As will be seen in Table 2, the main causes of death were as follows:—

Disease.	No. of cases.	Percentage.
Gastro-enteritis and Diarrhoea..	56	30·3
Pneumonia (all forms) ...	37	20·0
Prematurity ...	28	15·1

It was not found that any other disease accounted for an undue proportion of the deaths.

(b) *House to House Survey.*

As a result of the visits of the health visitors, 152 cards were completed. In the remaining cases the parents had left the town, or were for some other reason unable to be interviewed. In only four cases was information refused, and the general experience of the health visitors was that mothers were very willing to co-operate in the investigation. The following information is based on a perusal of these 152 cards.

(i) *Place of Birth.*

The places of birth of the deceased infants were as follows:—

Home ...	51 (33·6 per cent.)
Hospital ...	86 (56·6 per cent.)
Nursing Home ...	15 (9·8 per cent.)

In considering these percentages, it should be remembered that of the total of 2,022 live births to Bootle mothers during the year, 51 per cent. took place in institutions.

(ii) *Place of Death.*

The places of death of the deceased infants were as follows:—

Home ...	39 (25·7 per cent.)
Hospital ...	111 (73·0 per cent.)
Nursing Home ...	2 (1·3 per cent.)

(iii) *Relation of Gastro-enteritis to method of feeding.*

As regards the 45 infants who died from gastro-enteritis, the investigation showed that the method of feeding was as follows:—

Breast fed	...	...	...	...	...	9
Bottle fed	...	...	...	...	...	7
Commencing with breast feeding and later changing to bottle feeding	...	...	...	...	...	29

The health visitors reported that facilities for the storage of food were satisfactory in 37 cases, and unsatisfactory in 8 cases.

(iv) *Health Visitors' impression of mothers' ability and aptitude as regards hygienic feeding.*

The health visitors reported as follows:—

Excellent	...	...	...	...	...	23
Good	...	...	...	...	...	48
Moderate	...	...	...	...	...	55
Bad	...	...	...	...	...	26

(v) *Parity of Mother.*

In 50 cases infant death followed the mother's first confinement, in 33 cases her second confinement, and in 26 cases her third confinement. These account for 71·7 per cent. of the 152 infant deaths. On the other hand, one of the infants who died was an eighth child, one a tenth child, and one an eleventh child.

(vi) *Age of Mother.*

The ages at the time of confinement of the mothers of those infants who died were as follows:—

Under 25	...	...	...	...	48
25 and under 30	...	...	...	...	43
30 .. , 35	...	...	...	...	34
35 .. , 40	...	...	...	...	18
40 .. , 45	...	...	...	...	9

(vii) *Ante-natal care.*

In all cases interviewed the mother had received ante-natal care. This was provided as follows:—

Local authority's clinics	...	...	...	91
General medical practitioners	...	...	...	16
Hospital clinics	...	...	...	38
Midwives	...	...	...	7

(viii) *Maternal employment during pregnancy.*

In 125 cases the mother was employed solely on household duties, and in the remaining 27 cases she was engaged in factory or other work outside the home.

(ix) *Father's employment.*

In 129 cases the husband was employed in regular work. In 12 cases he was stated to be irregularly employed, and in 11 cases he had been unemployed prior to the birth of the infant for periods varying from one month to eighteen months, and in one case for seven years.

(x) *General standard of living.*

Of the 152 homes visited, the health visitors reported their impression of the standard of living as follows:—

Comfortable	...	...	...	...	...	80
Moderate	...	...	...	...	...	47
Poor	...	...	...	...	...	25

As regards cleanliness, conditions were reported as follows:—

Clean	...	...	...	...	...	93
Moderately clean	...	...	...	...	...	40
Dirty	...	...	...	...	...	19

In 104 cases the facilities for washing napkins were reported to be adequate, and in 48 cases inadequate.

(xi) *Housing.*

A perusal of the reports of the sanitary inspectors gave the following information with regard to the housing position of the parents:—

Tenants of whole house	...	...	...	79
Tenants with part of house sub-let to others	...	...	...	30
Sub-tenants	...	...	...	43

Overcrowding was noted in 18 cases as follows:—

In houses occupied by one family	...	...	4
In houses where house occupied by two or more families	...	...	14

In 69 houses there was no bathroom.

(c) *Information from other authorities.*

In addition to the information as to infant mortality rates, data in respect of the number of births, area, and the number of health visitors' visits in connection with maternity and child welfare work were also collected for the 87 authorities referred to above, and this information was used to investigate the possibility of a correlation existing between (a) the infant mortality rate and birth rate; (b) the infant mortality rate and population density; and (c) the infant mortality rate and the intensity with which health visiting was carried out. The data and calculations are reproduced in Tables 4, 5 and 6, respectively, on pages 18 to 20, and the conclusions to be drawn from these data are summarised on pages 10 to 13. Regarding density of population, a factor to which I have alluded as the "Population Density Index" was obtained by dividing the number of births in each local authority by the area of the authority in acres (excluding river beds and dock estates). To obtain an index of the intensity with which health visiting was carried out in each authority, I have used a figure referred to as the "Health Visiting Index," obtained by dividing the number of visits paid by health visitors in connection with maternity and child welfare work during the year by the number of births.

III. CONCLUSIONS.

(a) *Causes of death.*

The principal causes of death were (a) gastro-enteritis and diarrhoea; (b) pneumonia; (c) prematurity, which together accounted for 65.4 per cent. of the infant deaths. The incidence of death from these causes for the years 1935 to 1947 is shown in Table 7, from which it will be noted that the most significant feature is the very high percentage of infant deaths attributable to gastro-enteritis in the year 1947.

Of the 56 cases of infant death due to gastro-enteritis, it was possible to interview the mothers in 45 cases. Of these, it was found that 5 babies were born in hospital and died without leaving the institution.

While deaths from pneumonia and prematurity were in the case of 1947 below the average for the past ten years, they nevertheless accounted jointly for over 35 per cent. of the infant deaths. This substantial toll of infant life is a clear indication of the need for continuation by the paediatricians of the intensive efforts which they are making to overcome these conditions.

(b) *Investigation into home conditions.*

It is unsatisfactory to attempt to carry out an enquiry of this nature by obtaining information only into the circumstances attending the infant deaths, without obtaining for purposes of comparison similar data regarding those infants who survived. An investigation on these lines would, however, have entailed visits to over 2,000 homes to enable the cards to be completed, a matter far beyond the resources of the small staff of health visitors and sanitary inspectors employed in this Department.

Although 66·4 per cent. of the deceased infants whose parents were interviewed had been born in hospital or nursing home, it must be remembered that 51 per cent. of all births to Bootle mothers in 1947 took place in institutions, and it would not therefore be justifiable to attach any significance to this figure.

It is worthy of note that with regard to the mothers' ability and aptitude as regards hygienic feeding, the health visitors reported that in 71 cases these were excellent or good, and in 81 cases moderate or bad. This appears to be a clear indication of the need for further education of expectant and nursing mothers in the principles of hygienic food preparation.

Since first, second or third confinements produced 71·7 per cent. of the infants who died, and since 60 per cent. of the deceased infants were born to mothers under the age of 30 years, it does not appear that either multiparity or unduly advanced age of the mother is a factor of consequence.

In only 27 cases (17·8 per cent.) was the mother engaged in factory or other work outside the home, and there is no reason to believe that this figure is significantly in excess of that applying to mothers generally.

In 129 cases (85 per cent.) the husband was stated to be in regular employment, and in 127 cases (84 per cent.) the health visitors reported the general standard of living to be comfortable or moderately comfortable. In 143 cases (94 per cent.) the homes were reported to be clean or moderately clean, and in 104 cases (68 per cent.) the facilities for washing napkins were reported to be adequate.

In 73 cases (48 per cent.) the parents of deceased infants were sharing housing accommodation with others, and in 18 cases (12 per cent.) overcrowding was noted. In 69 cases (45 per cent.) there was

no bathroom in the house. In the absence of similar figures relating to the total births, it is not possible to draw any conclusions as to whether these conditions would have been likely adversely to affect the infant mortality rate.

(c) Correlation of Infant Mortality Rate with Birth Rate.

Observers have from time to time remarked upon the fact that a high birth rate tends to be associated with a high rate of infant mortality, and the data reproduced in Table 4 (page 18) support this observation by demonstrating a statistically significant positive correlation between these two factors. (Coefficient of Correlation: + 0.5002; Standard Error: ± 0.0799)

The Coefficient of Regression of Infant Mortality Rate on Birth Rate is calculated to be 2.895. In other words, for a unit rise in the Birth Rate above the Mean Birth Rate, the rate of infant mortality may be expected to rise by 2.895 above the Mean Infant Mortality Rate.

The Birth Rate of Bootle has during the past fifty years been consistently higher than that for England and Wales, as is shown in tabular form in Table 8 and graphically in Figure 3 (pages 22 and 25), and it thus appears reasonable to expect the Infant Mortality Rate to be higher than the national average. This point is developed in paragraph (f) below.

(d) Correlation of Infant Mortality Rate with Population Density.

Reason would lead one to expect a higher rate of infant mortality in a congested industrial area than in one where the people were more sparsely distributed over suburban or semi-rural territory. Bootle is a very compact, densely-populated borough, largely concerned with manufacturing and shipping, and having within its administrative confines no compensatory suburbs of a residential character such as are enjoyed by most towns. Apart from a small outlet in the north-east corner, Bootle is hemmed in on all sides by industrial congestion. Thus although as a County Borough it is from the statistical point of view a self-contained unit, a fair comparison of its statistics cannot be made with, for example, those of great cities like Manchester or Liverpool, but rather with the central industrial sections of those cities, where conditions are more similar to those obtaining in Bootle.

With a view to giving expression to this relationship between infant mortality and population density, I have based calculations, as shown in Table 5 (page 19), on the infant Mortality Rate on the one hand, and what I have termed the Population Density Index, on the other. This Population Density Index represents the number of births per acre in respect of each authority during 1947. It is appreciated that this does not take into account the effect of residential buildings with numerous storeys, such as large blocks of flats, but it is not thought that this factor will greatly influence the accuracy of the Index as a whole.

As will be seen from Table 5 (page 19), a statistically significant coefficient of correlation of moderate degree has been established between these two factors. (Coefficient of Correlation: +0.3962; Standard Error: ± 0.0899).

Calculation of the Coefficient of Regression of Infant Mortality Rate on Population Density Index shows it to be 30.92, or in other words, for a unit rise in the Population Density Index above the Mean Population Density Index, the Infant Mortality Rate may be expected to rise above the Mean Infant Mortality Rate by 30.92.

Thus, as reason would lead one to expect, there appears to be a definite relationship between congestion and high infant mortality, and since the Population Density Index in Bootle (0.8378 births per acre) was more than twice the average (0.3633 births per acre) of those in the areas of the other 87 authorities included in the survey, it seems justifiable to conclude that the congestion factor may be one of importance in bringing about the Borough's high Infant Mortality Rate. In other words, the consistently high Infant Mortality Rate may in some degree be an artificial one brought about by the limited political confines of the County Borough, the self-contained statistical unit on which all rates are calculated.

The coefficient of regression of Infant Mortality Rate on Population Density Index is considered jointly with that of Infant Mortality Rate on Birth Rate on page 65.

(e) *Correlation of Infant Mortality Rate with the Intensity with which Health Visiting is carried out.*

With a view to investigating the possibility of a relationship existing between infant mortality and the intensity with which health visiting is carried out, information was obtained in respect of the year 1947 from 87 authorities as to the number of visits paid by Health

Visitors in connection with maternity and child welfare work. This has been divided in the case of each authority by the number of births during the year to give what I have referred to as the Health Visiting Index, as shown in Table 6 (page 20), and an attempt has been made to establish a correlation between this and the Infant Mortality Rate. The calculation has revealed that, contrary to what one would expect, a small *positive* correlation exists between the Infant Mortality Rate and the Health Visiting Index. (Coefficient of Correlation: +0.2301; Standard Error: ± 0.1009 .) In other words, those places where the intensity of health visiting is above the average show a slight tendency to have an Infant Mortality Rate also above the average. This may well be because such places as have high Infant Mortality Rates are the very places where the social conscience is most aware of the need for improvement in the public health generally, and where health visiting has consequently been intensified, although the effort has not yet been rewarded by any resulting diminution in the Infant Mortality Rate.

(f) *Further Consideration of the Effects of Birth Rate and Population Density on the Infant Mortality Rate.*

It has been shown that for a unit rise in the Birth Rate above the Mean Birth Rate, the Infant Mortality Rate may be expected to rise above the Mean Infant Mortality Rate by 2.895.

In 1947 the Bootle Birth Rate of 30.4 was 7.9 above the Mean Birth Rate of 22.5 in the 88 authorities included in the survey. The Bootle Infant Mortality Rate may therefore be expected to exceed the Mean Infant Mortality Rate by 7.9×2.895 , *i.e.* by 22.87. Adding this expected increase to the Mean Infant Mortality Rate for the 88 authorities of 50.7, one therefore finds that in consideration of its high Birth Rate, and apart from any other considerations, the Infant Mortality Rate of Bootle would have been expected to be 73.57.

If in addition to this, one considers the matter of the Population Density Index, it is found that for a unit increase in the latter above the mean, the Infant Mortality Rate might be expected to increase by 30.92 above its mean. The Bootle Population Density Index of 0.8375 exceeds the Mean Population Density Index of 0.3633 by 0.4742, and the Bootle Infant Mortality Rate may therefore be expected to exceed the Mean Infant Mortality Rate by 0.4742×30.92 , *i.e.* by 14.66. By adding this to the figure of 73.57 obtained above, an Infant Mortality Rate of 88.23 is obtained, a figure not greatly at variance with the rate of 91.5 actually experienced.

It is to be noted that although increase of Infant Mortality has been shown to proceed *pari passu* with increase of Birth Rate and increase of Population Density Index, it does not necessarily follow that increase of either of these factors is the cause of such increased Infant Mortality Rate, because the statistician can make no greater blunder than to assume that correlation necessarily implies causation. That other factors are involved is apparent from the experience of such authorities as West Ham and East Ham, where in spite of Birth Rates above the average, *viz.*, 26·6 and 23·9 respectively, the Infant Mortality Rates were substantially below the average at 41·0 and 30·0 respectively. Again, considering the Population Density of these two industrial County Boroughs, it is found that West Ham, with a Population Density Index of 0·9720, and East Ham, with a Population Density Index of 0·8530, both well above the average of 0·3633, have, as noted above, Infant Mortality Rates markedly below the average.

Notwithstanding the limitations imposed in the preceding paragraph, it may well be considered that a high density of population is nevertheless causally related to a high Infant Mortality Rate. In the case, however, of the correlation between Birth Rate and Infant Mortality Rate, it is not justifiable to conclude that the factors are necessarily causally dependent on one another, and are not the result of some extraneous factor the nature of which did not emerge from the survey.

(g) *General.*

I feel it is a mistake to attach too much significance to the figure for a single year, as a study of the trend lines in Figure 2 shows that over a period of years the Infant Mortality Rate is steadily being reduced. Although the rate for 1947 showed a large increase, being the highest since 1941, that for 1948 of 54·1 per 1,000 live births is the lowest ever recorded. The latter is, however, substantially above the national rate of 34·0, and thus does not afford any ground for complacency, although it may be regarded with some satisfaction as an indication of the general trend.

A further limitation is imposed on a survey of this nature by the fact that there are undoubtedly at work other factors, many of which do not lend themselves to statistical measurement.

Our principal means of reducing infant mortality is education of the people, and particularly the mothers, in the principles of hygiene, especially the hygiene of infant life and the prevention of infection. Few mothers realise how easily babies may be infected by contact with those suffering from catarrh of the respiratory passages, especially in badly-ventilated and crowded places such as buses, cinemas, and in some cases the congested waiting rooms in doctors' surgeries. Another prolific source of infection is the feeding-bottle. Too many mothers are unwilling to persevere with breast-feeding, and many of them do not realise the necessity for scrupulous care in the preparation of feeds and the sterilisation of bottles if gastro-intestinal infections of a serious character are to be avoided.

Our mainstay in the reduction of the toll of infant life will continue to be the Health Visitor and the Sanitary Inspector, who, in their day-to-day contact with the public do so much to spread knowledge of the methods of healthy living.

Although it is perhaps not justifiable to draw general conclusions from such a small "sample," the survey nevertheless showed that approximately half of the parents of deceased infants were sharing houses with other persons, houses which were built for one family and were not intended to be occupied by two or more families. The provision of adequate housing accommodation must remain one of the most pressing duties of the local authority, although it is evident that such provision cannot be adequately made within the limitations of the Borough's present boundaries.

In conclusion I would like to express my appreciation of the work carried out in connection with this survey by the members of my staff, particularly Mr. H. A. Lord, Administrative Assistant; Mr. W. H. Wattleworth, Chief Sanitary Inspector, and his staff; and Miss E. Dowd, Superintendent Nursing Officer, and the Health Visitors. My thanks are also due to the Medical Officers of Health of the 87 local authorities for the supply of data on which the statistical calculations are based.

JAMES F. SWAN,

Medical Officer of Health.

September, 1949.

Table 1.

Infant Mortality Rates, Bootle and England and Wales, 1898-1948

Year.	Infant Mortality Rate.	
	Bootle.	England and Wales.
1898	183	161
1899	186	163
1900	204	154
1901	183	151
1902	154	133
1903	161	132
1904	180	145
1905	153	128
1906	143	128
1907	123	118
1908	123	120
1909	118	109
1910	123	107
1911	145	130
1912	108	95
1913	145	109
1914	123	105
1915	142	110
1916	109	91
1917	99	97
1918	116	97
1919	96	89
1920	97	80
1921	96	83
1922	80	77
1923	85	69
1924	99	75
1925	97	75
1926	100	70
1927	78	69
1928	107	65
1929	83	74
1930	79	60
1931	95	66
1932	86	65
1933	88	64
1934	77	59
1935	92	57
1936	68	59
1937	77	58
1938	81	53
1939	65	50
1940	80	55
1941	108	59
1942	72	49
1943	76	49
1944	61	46
1945	69	46
1946	75	43
1947	91	41
1948	54	34

Causes of and Ages at Death.

CAUSES OF DEATH.	Under 1 week.	1—2 weeks.	2—3 weeks.	3—4 weeks.	Total under 4 weeks.	4 weeks and under 3 months.	3 months and under 6 months.	6 months and under 9 months.	9 months and under 12 months.	Total Deaths under One Year.
Small-pox ...	...	...	...	...	...	...	...	...	...	...
Chicken-pox ...	...	...	...	...	...	...	...	...	...	...
Measles ...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever ...	...	...	...	...	...	1	—	1	1	3
Whooping Cough ...	...	...	...	...	...	...	...	...	...	1
Diphtheria and Croup ...	...	...	...	...	...	...	...	...	...	...
Erysipelas ...	...	...	...	...	...	...	...	...	...	...
Tuberculous Meningitis ...	...	...	...	...	...	...	...	...	...	...
Abdominal Tuberculosis ...	...	...	...	...	...	...	...	...	...	...
Other Tuberculous Diseases ...	...	...	...	...	...	...	...	...	...	...
Meningitis (<i>not Tuberculous</i>) ...	...	...	1	...	1	...	...	...	...	1
Convulsions ...	...	...	...	...	...	...	...	...	...	...
Laryngitis ...	...	...	...	...	...	1	1	...	...	2
Bronchitis ...	...	...	1	3	7	10	9	8	3	37
Pneumonia (all forms) ...	1	2	1	...	...	22	6	10	8	56
Diarrhoea ...	...	2	1	7	10	...	...	...	...	...
Enteritis ...	...	...	...	...	...	...	...	...	...	...
Gastritis ...	...	...	...	...	...	...	...	...	...	...
Syphilis ...	...	...	...	...	...	...	...	...	...	...
Rickets ...	...	...	...	...	...	...	...	...	...	...
Suffocation, overlying ...	...	...	...	...	...	...	...	...	...	...
Injury at Birth ...	...	...	...	...	...	...	...	...	...	...
Atelectasis ...	4	...	...	1	5	1	...	...	...	6
Congenital Malformations ...	5	...	3	...	8	3	1	...	...	12
Premature Birth ...	15	3	2	4	24	4	...	...	...	28
Atrophy, Debility and Marasmus ...	1	1	...	1	3	1	1	...	...	5
Other Causes ...	8	1	4	2	15	10	3	2	3	33
All Causes { Certified ...	34	9	12	18	73	53	21	21	16	184
{ Uncertified ...	—	—	—	1	1	—	—	—	—	1
Totals ...	34	9	12	19	74	53	21	21	16	185

Table 3.

Infant Mortality Rates, 1947, Bootle and Eighty-seven other Authorities in Great Britain and Eire.

<i>Name of Authority.</i>	<i>Infant Mortality Rate.</i>	<i>Name of Authority.</i>	<i>Infant Mortality Rate.</i>
BOOTLE C.B. ...	91·5	Nottingham C.B.	50
Dublin C.B.	88	Plymouth C.B.	49·88
Cork C.B.	87	Burnley C.B.	49·15
Warrington C.B.	85	Stockport C.B.	48·39
Chester C.B.	85	South Shields C.B.	48
Dun Laoghaire B.	78	Worcester C.B.	46·2
Glasgow City	77	Dewsbury C.B.	45·19
Birkenhead C.B.	72	Coventry C.B.	45
St. Helens C.B.	69·8	Burton-upon-Trent C.B.	44
Liverpool C.B.	69	Newcastle-upon Tyne C.B.	44
Preston C.B.	67	Swansea C.B.	44
Wigan C.B.	67	Doncaster C.B.	43·6
Londonderry C.B.	66·07	Blackpool C.B.	43·4
West Hartlepool C.B.	65	Wolverhampton C.B.	43
Greenock B.	64	Barnsley C.B.	43
Middlesbrough C.B.	64	Smethwick C.B.	42·9
Newport, Mon., C.B.	61·3	Sheffield C.B.	42
Stoke-on-Trent C.B.	61	Halifax C.B.	41·77
Salford C.B.	61	Blackburn C.B.	41·01
Sunderland C.B.	60	West Ham C.B.	41
Belfast C.B.	60	Southport C.B.	41
Manchester C.B.	59·76	Birmingham C.B.	41
Bradford C.B.	59	Bath C.B.	40
Port Glasgow B.	58·8	Wakefield C.B.	39·9
Oldham C.B.	58	Bury C.B.	38
Exeter C.B.	57·4	Croydon C.B.	38
Rotherham C.B.	57	Bolton C.B.	37·8
Carlisle C.B.	56·5	Darlington C.B.	37·7
Tynemouth C.B.	55·82	Norwich C.B.	37·14
Rochdale C.B.	55	Bournemouth C.B.	35·17
Gateshead C.B.	55	Reading C.B.	35·1
Jarrow-on-Tyne M.B.	54·69	Canterbury C.B.	34·8
West Bromwich C.B.	54·61	Portsmouth C.B.	33·4
Derby C.B.	54·3	Lincoln C.B.	33
Cardiff C.B.	54	Great Yarmouth C.B.	32·46
Huddersfield C.B.	54	Southend-on-Sea C.B.	31·57
Southampton C.B.	53·35	Eastbourne C.B.	31·5
Brighton C.B.	52	East Ham C.B.	30
Kingston-upon-Hull C.B.	51·5	Ipswich C.B.	30
Barrow-in-Furness C.B.	51·45	Oxford C.B.	29·55
Wallasey C.B.	51·11	Bristol C.B.	29
Leeds C.B.	51	Hastings C.B.	26·6
Dudley C.B.	50·72	Renfrew B.	25·9
Walsall C.B.	50·1	Poole M.B.	22·19

Table 4.

Correlation of Infant Mortality Rate with Birth Rate, 1947.

(1) Local Authority	(2) I.M.R.	(3) Mean Deviation of I.M.R.	(4) Square of (3).	(5) Live Births	(6) Popu- lation	(7) Birth Rate	(8) Mean Deviation of B.R.	(9) Square of (8)	(10) Product of (3) and (8)
	A	a	a ²			B	b	b ²	ab
1. Bootle C.B.	91.5	40.8	1664.64	2022	66,610	30.4	7.9	62.41	322.40
2. Dublin City	88.0	37.3	1391.29	13484	513,500	26.3	3.8	14.44	141.70
3. Cork City	87.0	36.3	1317.69	1800	75,361	23.9	1.4	1.96	50.83
4. Warrington C.B.	85.0	34.3	1176.49	1760	77,390	22.8	0.3	0.09	10.29
5. Chester C.B.	85.0	34.3	1176.49	1046	47,100	22.2	0.3	0.09	10.29
6. Dun Laoghaire B.	78.0	27.3	745.29	929	44,689	20.8	1.7	2.89	46.40
7. Glasgow City	77.0	26.3	691.69	25829	1,100,000	23.5	1.0	1.00	26.30
8. Birkenhead C.B.	72.0	21.3	453.69	3339	134,100	24.9	2.4	5.76	52.00
9. St. Helens C.B.	69.8	19.1	364.81	2663	105,790	25.2	2.7	7.29	51.53
10. Liverpool C.B.	69.0	18.3	334.89	19904	753,340	26.4	3.9	15.21	71.34
11. Preston C.B.	67.0	16.3	265.69	2574	116,520	22.1	0.4	0.16	6.52
12. Wigan C.B.	67.0	16.3	265.69	1886	84,150	22.5	0.0	0.00	0.00
13. Londonderry C.B.	66.1	15.4	237.16	1439	48,919	29.5	7.0	49.00	107.80
14. West Hartlepool C.B.	65.0	14.3	204.49	1741	69,860	24.9	2.4	5.76	34.33
15. Greenock B.	64.0	13.3	176.89	1886	79,377	23.8	1.3	1.69	17.28
16. Middlesbrough C.B.	64.0	13.3	176.89	3631	140,460	25.9	3.4	11.56	45.25
17. Newport (Mon.) C.B.	61.3	10.6	112.36	2283	100,710	22.7	0.2	0.04	2.12
18. Stoke on Trent C.B.	61.0	10.3	106.09	6360	270,200	23.5	1.0	1.00	10.30
19. Salford C.B.	61.0	10.3	106.09	4220	174,070	24.2	1.7	2.89	17.51
20. Sunderland C.B.	60.0	9.3	86.49	4352	178,530	24.4	1.9	3.61	17.67
21. Belfast C.B.	60.0	9.3	86.49	10905	450,000	23.3	0.8	0.64	7.44
22. Manchester C.B.	59.8	9.1	82.81	15830	685,560	23.1	0.6	0.36	5.46
23. Bradford C.B.	59.0	8.3	68.89	6334	284,900	22.2	6.0	36.00	48.60
24. Port Glasgow B.	58.8	8.1	65.61	612	21,493	28.5	1.0	1.00	7.30
25. Oldham C.B.	58.0	7.3	53.29	2533	117,900	21.5	3.2	10.24	21.44
26. Exeter C.B.	57.4	6.7	44.89	1428	74,160	19.3	1.4	1.96	8.82
27. Rotherham C.B.	57.0	6.3	39.69	1908	79,920	23.9	0.7	0.49	4.06
28. Carlisle C.B.	56.5	5.8	33.64	1409	63,620	23.2	0.3	0.09	1.53
29. Tynemouth C.B.	55.8	5.1	26.01	1407	63,360	22.2	2.5	6.25	10.75
30. Rochdale C.B.	55.0	4.3	18.49	1725	86,110	20.0	1.8	3.24	7.74
31. Gateshead C.B.	55.0	4.3	18.49	2756	113,580	24.3	3.6	12.96	14.40
32. Jarrow on Tyne M.B.	54.7	4.0	16.00	713	27,370	26.1	0.1	0.01	0.08
33. West Bromwich C.B.	54.6	3.9	15.21	1758	84,160	20.9	1.6	2.56	6.24
34. Derby C.B.	54.3	3.6	12.96	3994	140,030	22.1	0.4	0.16	1.44
35. Cardiff C.B.	54.0	3.3	10.89	5299	230,630	23.0	0.5	0.25	1.65
36. Huddersfield C.B.	54.0	3.3	10.89	2555	123,960	20.6	1.9	3.61	6.27
37. Southampton C.B.	53.4	2.7	7.29	4217	167,010	25.3	2.8	7.84	7.56
38. Brighton C.B.	52.0	1.3	1.69	2025	151,700	19.3	3.2	10.24	4.16
39. Kingston upon Hull C.B.	51.5	0.8	0.64	7751	284,600	27.2	4.7	22.09	3.76
40. Barrow in Furness C.B.	51.5	0.8	0.64	1316	67,030	22.6	0.1	0.01	0.08
41. Leeds C.B.	51.0	0.4	0.16	2152	98,780	21.8	0.7	0.49	0.28
42. Dudley C.B.	50.7	0.3	0.09	10822	495,300	21.9	0.6	0.36	0.18
43. Walsall C.B.	50.1	0.0	0.00	1321	62,480	21.1	1.4	1.96	0.00
44. Nottingham C.B.	50.0	0.6	0.36	2533	109,380	23.5	1.0	1.00	0.00
45. Plymouth C.B.	50.0	0.7	0.49	6014	290,398	23.8	1.3	1.69	0.91
46. Burnley C.B.	49.9	0.8	0.64	4400	181,600	24.7	2.2	4.84	1.76
47. Stockport C.B.	48.4	1.5	2.25	1831	83,650	21.9	0.6	0.36	0.90
48. South Shields C.B.	48.0	2.3	5.29	3038	140,720	21.6	0.9	0.81	2.07
49. South Shields C.B.	48.0	2.3	5.29	2441	101,780	24.0	1.5	2.25	4.05
50. Worcester C.B.	46.2	4.5	20.25	1256	60,790	20.7	1.8	3.24	8.10
51. Coventry C.B.	45.2	5.5	30.25	1217	50,880	23.9	1.4	1.96	7.70
52. Burton upon Trent C.B.	45.0	5.7	32.49	5643	242,860	23.3	0.8	0.64	4.56
53. Newcastle upon Tyne C.B.	44.0	6.7	44.89	1134	48,690	23.3	0.8	0.64	5.36
54. Swansea C.B.	44.0	6.7	44.89	6449	290,470	22.2	0.3	0.09	2.01
55. Doncaster C.B.	44.0	6.7	44.89	3350	152,290	22.0	0.5	0.25	3.35
56. Blackpool C.B.	43.6	7.1	50.41	1697	75,980	22.2	0.3	0.09	2.13
57. Wolverhampton C.B.	43.4	7.3	53.29	2326	152,660	15.2	7.3	53.29	53.29
58. Wolverhampton C.B.	43.0	7.7	59.29	3362	155,610	21.6	0.9	0.81	6.93
59. Barnsley C.B.	43.0	7.7	59.29	1663	73,600	22.6	0.1	0.01	0.77
60. Smethwick C.B.	42.9	7.8	60.84	1608	73,670	21.3	1.2	1.44	9.36
61. Sheffield C.B.	42.0	8.7	75.69	10322	508,370	21.7	0.8	0.64	6.96
62. Halifax C.B.	41.8	8.9	79.21	1892	108,390	19.1	3.4	11.56	32.13
63. Blackburn C.B.	41.0	9.7	94.09	2075	108,390	19.1	3.4	11.56	32.99
64. West Ham C.B.	41.0	9.7	94.09	4573	171,870	26.6	4.1	16.81	39.77
65. Southport C.B.	41.0	9.7	94.09	1314	84,240	15.6	6.9	47.61	66.93
66. Birmingham C.B.	41.0	9.7	94.09	24142	1,072,000	22.5	0.0	0.00	0.00
67. Bath C.B.	40.0	10.7	114.49	1335	70,530	20.1	2.4	5.76	25.68
68. Wakefield C.B.	39.9	10.8	116.64	1201	57,690	20.8	1.7	2.89	18.36
69. Bury C.B.	38.0	12.7	161.29	1161	56,280	20.6	1.9	3.61	24.13
70. Croydon C.B.	38.0	12.7	161.29	5100	242,770	21.0	1.5	2.25	19.05
71. Bolton C.B.	37.8	12.9	166.41	3382	163,850	20.6	1.9	3.61	24.51
72. Darlington C.B.	37.8	12.9	166.41	1721	83,600	20.6	1.9	3.61	24.70
73. Norwich C.B.	37.1	13.6	184.96	1721	83,600	21.5	1.0	1.00	13.60
74. Bournemouth C.B.	35.2	13.5	180.25	2477	114,900	21.5	6.6	43.56	120.25
75. Reading C.B.	35.1	15.6	243.36	2169	138,020	15.9	0.1	0.01	1.56
76. Canterbury C.B.	35.1	15.6	243.36	2533	112,000	22.6	0.3	0.09	4.77
77. Portsmouth C.B.	34.8	15.9	252.81	553	24,330	22.8	1.8	3.24	31.12
78. Lincoln C.B.	33.4	17.3	299.29	5149	212,020	24.3	0.3	0.09	35.40
79. Great Yarmouth C.B.	33.0	17.7	313.29	1345	65,770	20.5	2.0	4.00	3.64
80. Southend on Sea C.B.	32.5	18.2	331.24	1078	47,410	22.7	0.2	0.04	5.73
81. Eastbourne C.B.	31.6	19.1	364.81	3709	144,350	22.2	0.3	0.09	78.71
82. East Ham C.B.	31.5	19.2	368.64	983	53,540	18.4	4.1	16.81	28.97
83. Ipswich C.B.	30.0	20.7	428.49	2835	118,670	23.9	1.4	1.96	2.07
84. Oxford C.B.	30.0	20.7	428.49	2281	100,810	22.6	0.1	0.01	86.92
85. Bristol C.B.	29.5	21.2	449.44	1895	103,210	18.4	4.1	16.81	26.02
86. Hastings C.B.	29.0	21.7	470.89	9142	428,600	21.3	1.2	1.44	79.53
87. Renfrew B.	26.6	24.1	580.81	1203	62,710	19.2	3.3	10.89	64.49
88. Poole M.B.	25.9	24.8	615.04	348	17,588	19.9	2.6	6.76	37.03
	22.2	28.5	812.25	1667	78,720	21.2	1.3	1.69	
	4460.3		19991.11			1977.6		596.66	1990.48-262.90 = 1727.58
n = 88	Mean : 50.7		Sa ²			Mean : 22.5		Sb ²	Sab = 19.632 n

Standard Deviation of Infant Mortality Rate ..

Standard Deviation of Birth Rate ..

Coefficient of Correlation ..

Standard Error ..

Coefficient of Regression of Infant Mortality Rate on Birth Rate

15.0722

2.6039

+ 0.5002

± 0.0799

2.8954

Table 5.

Correlation of Infant Mortality Rate with Population Density, 1947

(1) Local Authority	(2) I.M.R.	(3) Mean Deviation of I.M.R.	(4) Square of (3).	(5) Live Births	(6) Area (Acres)	(7) P.D. Index (Births per acre)	(8) Mean Deviation of P.D.I.	(9) Square of (8)	(10) Product of (3) and (8)
	A	a	a ²			C	c	c ²	+
1. Bootle C.B.	91.5	40.8	1664.64	2022	2414	0.8375	0.4742	0.22487	19.3474
2. Dublin City	88.0	37.3	1391.29	13484	21825	0.6173	0.2540	0.06452	9.4742
3. Cork City	87.0	36.3	1317.69	1800	2685	0.6706	0.3073	0.09443	11.1550
4. Warrington C.B.	85.0	34.3	1176.49	1760	4532	0.3882	0.0249	0.00062	0.8941
5. Chester C.B.	85.0	34.3	1176.49	1046	5160	0.2026	0.0252	0.00052	5.5120
6. Dun Laoghaire B.	78.0	27.3	745.29	929	4179	0.2223	0.1410	0.01988	3.8493
7. Glasgow City	77.0	26.3	691.69	2829	39725	0.6505	0.2872	0.08218	7.5534
8. Birkenhead C.B.	72.0	21.3	453.69	3339	8598	0.3885	0.0252	0.00064	0.5368
9. St. Helens C.B.	69.0	18.3	334.89	2663	7950	0.3250	0.0283	0.00080	0.5495
10. Liverpool C.B.	67.0	16.3	265.69	1904	27364	0.7270	0.3637	0.13228	6.6557
11. Preston C.B.	67.0	16.3	265.69	3574	5757	0.4470	0.0837	0.00701	1.3643
12. Wigan C.B.	66.1	15.4	237.16	1886	5083	0.3708	0.0075	0.00066	0.1223
13. West Hartlepool C.B.	65.0	14.3	204.49	1439	2311	0.6228	0.2595	0.06734	3.9963
14. Greenock B.	64.0	13.3	176.89	1741	4473	0.3891	0.0258	0.00067	0.3689
15. Middlesbrough C.B.	64.0	13.3	176.89	1886	3745	0.5037	0.1404	0.01971	1.8673
16. Newport (Mon.) C.B.	61.3	10.6	112.36	3631	7205	0.5940	0.1407	0.01980	1.8713
17. Stoke on Trent C.B.	61.0	10.3	106.09	2283	7873	0.2900	0.0733	0.00537	0.7770
18. Salford C.B.	61.0	10.3	106.09	6360	21190	0.3003	0.0030	0.00097	0.6489
19. Sunderland C.B.	60.0	9.3	86.49	4220	5202	0.3112	0.4479	0.20061	4.6134
20. Belfast C.B.	60.0	9.3	86.49	4352	6938	0.6275	0.2642	0.06080	2.4571
21. Manchester C.B.	59.8	9.1	82.81	10505	14797	0.7100	0.3467	0.12020	3.2243
22. Bradford C.B.	59.0	8.3	68.89	15830	27256	0.5807	0.2174	0.04726	1.9783
23. Port Glasgow B.	58.8	8.1	65.61	6334	25504	0.2484	0.1149	0.01320	0.9537
24. Oldham C.B.	58.0	7.3	53.29	612	1291	0.5023	0.1390	0.01932	1.1259
25. Exeter C.B.	57.4	6.7	44.89	2533	4735	0.3550	0.1717	0.02948	1.2534
26. Rotherham C.B.	57.0	6.3	39.69	1428	9127	0.1504	0.2069	0.04281	1.3862
27. Carlisle C.B.	56.5	5.8	33.64	1908	9255	0.2062	0.1571	0.02468	0.9897
28. Tynemouth C.B.	55.8	5.1	26.01	1469	4488	0.3273	0.0360	0.01300	0.2088
29. Rochdale C.B.	55.8	4.3	18.49	1407	4684	0.3004	0.0629	0.00396	0.3208
30. Gateshead C.B.	55.0	4.3	18.49	1725	9553	0.1806	0.1827	0.03338	0.7856
31. Jarrow on Tyne M.B.	55.0	4.3	18.49	2750	4470	0.6163	0.2530	0.06401	1.0879
32. West Bromwich C.B.	54.7	4.0	16.00	713	1985	0.3594	0.0039	0.00002	0.0156
33. Derby C.B.	54.6	3.9	15.21	1758	7172	0.2450	0.1183	0.01397	0.4614
34. Cardiff C.B.	54.3	3.6	12.96	3094	8133	0.3804	0.0171	0.00029	0.0616
35. Huddersfield C.B.	54.0	3.3	10.89	5299	16785	0.3158	0.0475	0.00226	0.1568
36. Southampton C.B.	53.4	2.7	7.29	2555	14149	0.1806	0.1827	0.03338	0.6029
37. Brighton C.B.	53.0	2.3	5.29	4217	9602	0.4390	0.0757	0.00573	0.2044
38. Kingston upon Hull C.B.	52.4	1.3	0.64	2955	12565	0.2328	0.1305	0.01703	0.1696
39. Barrow in Furness C.B.	51.5	0.8	0.64	7751	14433	0.5370	0.1737	0.03017	0.1390
40. Wallsley C.B.	51.1	0.4	0.16	1516	11003	0.1378	0.2255	0.05085	0.1804
41. Leeds C.B.	51.0	0.3	0.09	2152	9216	0.2334	0.1299	0.01687	0.0520
42. Dudley C.B.	50.7	0.0	0.00	10822	38297	0.2826	0.0807	0.00651	0.0242
43. Walsall C.B.	50.1	0.6	0.36	1321	4066	0.3248	0.0385	0.00148	0.0000
44. Nottingham C.B.	50.0	0.7	0.49	2533	8777	0.2887	0.0746	0.00556	0.0448
45. Plymouth C.B.	49.9	0.8	0.64	6944	10166	0.4277	0.0644	0.00115	0.0451
46. Burnley C.B.	49.2	1.5	2.25	4490	9515	0.4720	0.1087	0.01181	0.0870
47. Stockport C.B.	48.4	2.3	5.29	1831	4695	0.3901	0.0268	0.00072	0.0402
48. South Shields C.B.	48.0	2.7	7.29	3038	7976	0.3810	0.0177	0.00031	0.0407
49. Worcester C.B.	46.2	4.5	20.25	2441	4420	0.5525	0.1892	0.03580	0.5108
50. Dewsbury C.B.	45.2	5.5	30.25	1250	5394	0.3329	0.1304	0.01700	0.5868
51. Coventry C.B.	45.0	5.7	32.49	1267	6720	0.1812	0.1821	0.03316	1.0016
52. Burton upon Trent C.B.	44.0	6.7	44.89	5643	19167	0.2945	0.0688	0.00473	0.3922
53. Newcastle upon Tyne C.B.	44.0	6.7	44.89	1134	4222	0.2688	0.0945	0.00893	0.6332
54. Swansea C.B.	44.0	6.7	44.89	6449	11401	0.5657	0.2024	0.04097	1.3561
55. Doncaster C.B.	43.6	7.1	50.41	3350	2421	0.1382	0.2251	0.05067	1.5082
56. Blackpool C.B.	43.4	7.3	53.29	1607	7801	0.2175	0.1458	0.02126	1.0552
57. Wolverhampton C.B.	43.0	7.7	59.29	2326	10580	0.2200	0.1433	0.02053	1.0461
58. Barnsley C.B.	43.0	7.7	59.29	3302	9113	0.3688	0.0055	0.00003	0.0424
59. Smeethwick C.B.	42.9	7.8	60.84	1003	7811	0.2130	0.1503	0.02259	1.1573
60. Sheffield C.B.	42.0	8.7	75.69	1668	2500	0.6434	0.2801	0.07846	2.1848
61. Halifax C.B.	41.8	8.9	79.21	10522	39508	0.2658	0.09075	0.00051	0.8483
62. Blackburn C.B.	41.0	9.7	79.21	1802	14081	0.1344	0.2289	0.05240	2.0372
63. West Ham C.B.	41.0	9.7	79.21	1802	8080	0.2568	0.1065	0.00113	1.0331
64. Southport C.B.	41.0	9.7	79.21	2075	4706	0.9720	0.6087	0.37051	5.9044
65. Birmingham C.B.	41.0	9.7	79.21	4573	18333	0.0717	0.1087	0.08503	2.8285
66. Bath C.B.	40.0	10.7	114.49	24142	51117	0.4720	0.1087	0.01182	1.0544
67. Wakefield C.B.	40.0	10.8	116.64	1201	5300	0.2266	0.0655	0.00429	0.7009
68. Rury C.B.	38.0	12.7	161.29	1161	7434	0.1562	0.1367	0.01869	1.4764
69. Groydon C.B.	38.0	12.7	161.29	5100	1562	0.4026	0.2071	0.04289	2.0302
70. Bolton C.B.	38.0	12.7	161.29	5100	12672	0.4026	0.0393	0.00154	0.4991
71. Darlington C.B.	37.8	12.9	166.41	3382	15279	0.2215	0.1418	0.02011	1.8292
72. Norwich C.B.	37.7	13.6	184.96	3382	15279	0.2215	0.0971	0.00943	0.1262
73. Bournemouth C.B.	37.1	13.0	169.00	1721	6403	0.2662	0.0507	0.00257	0.6895
74. Reading C.B.	35.2	15.5	240.25	2477	7923	0.3126	0.0251	0.00366	2.7111
75. Canterbury C.B.	35.1	15.6	243.36	2533	9106	0.2782	0.0851	0.00724	1.3276
76. Portsmouth C.B.	34.8	15.9	252.81	2533	4706	0.1176	0.2457	0.00037	3.9067
77. Lincoln C.B.	33.4	17.3	299.29	5149	9223	0.5581	0.1948	0.03795	3.3700
78. Great Yarmouth C.B.	33.0	17.7	313.29	5149	9223	0.5581	0.1490	0.02220	2.6376
79. Southend on Sea C.B.	32.5	18.2	331.24	1345	6128	0.2143	0.1256	0.01578	2.2859
80. Eastbourne C.B.	31.6	19.1	364.81	1078	4534	0.3377	0.0521	0.00271	0.9951
81. East Ham C.B.	31.5	19.2	368.64	3199	10284	0.3112	0.2767	0.07656	5.3126
82. Ipswich C.B.	30.0	20.7	428.49	983	11336	0.0866	0.4897	0.23981	10.1368
83. Oxford C.B.	30.0	20.7	428.49	2835	3326	0.8530	0.1009	0.01011	2.0886
84. Bristol C.B.	29.5	21.2	449.44	2281	8692	0.2624	0.1388	0.01927	2.9426
85. Hastings C.B.	29.0	21.7	470.89	1895	8438	0.2746	0.0113	0.00013	0.2452
86. Renfrew B.	26.6	24.1	580.81	9442	24406	0.1548	0.2085	0.04339	5.0249
87. Poole M.B.	25.9	24.8	615.04	1203	7769	0.1550	0.2083	0.04339	5.1658
88. Poole M.B.	22.2	28.5	812.25	1667	15641	0.1066	0.2567	0.06589	7.2900
n = 88	4460.3	1999.11	812.25	1667	15641	31.9731	3.28105	101.4623	144.6147—43.1524
	Mean :		Sa ²	Mean :		Sc ²	Sac = 1.153	n	

Standard Deviation of Infant Mortality Rate ..

Standard Deviation of Population Density Index ..

Coefficient of Correlation ..

Standard Error ..

Coefficient of Regression of Infant Mortality Rate on Population Density Index ..

15.0722

0.1931

+ 0.3962

± 0.0899

30.9237

Table 6.

Correlation of Infant Mortality Rate with Intensity of Health Visiting Activity, 1947.

(1) Local Authority	(2) I.M.R.	(3) Mean Deviation of I.M.R.	(4) Square of (3).	(5) Visits	(6) Live Births	(7) H.V. Index	(8) Mean Deviation of H.V.I.	(9) Square of (8)	(10) Product of (3) & (8)
	A	a	a ²			D	d	d ²	ad
1. Bootle C.B.	91.5	40.8	1664.04	16341	2022	8.09	1.15	1.323	46.92
2. Dublin City	88.0	37.3	1391.29	200642	13484	14.88	5.64	31.810	210.37
3. Cork City	87.0	36.3	1317.69	10397	1800	5.78	3.46	11.972	125.60
4. Warrington C.B.	85.0	34.3	1176.49	17105	1760	9.72	0.48	0.239	16.46
5. Chester C.B.	85.0	34.3	1176.49	21088	1046	21.02	11.78	138.708	404.05
6. Dun Laoghaire B.	78.0	27.3	745.29	10127	929	10.90	0.66	0.436	18.02
7. Glasgow City	77.0	26.3	691.69	109518	25829	6.56	2.68	7.182	70.48
8. Birkenhead C.B.	72.0	21.3	453.69	18982	3339	5.69	3.55	12.602	75.62
9. St. Helens C.B.	69.8	19.1	364.81	29535	2603	11.09	1.85	3.423	35.34
10. Liverpool C.B.	69.0	18.3	334.89	227191	19904	11.42	2.18	4.752	39.89
11. Preston C.B.	67.0	16.3	265.69	12769	2574	4.96	4.28	18.318	69.76
12. Wigan C.B.	66.1	15.4	237.16	23786	1886	11.68	2.44	5.954	39.77
13. Londonderry C.B.	65.0	14.3	204.49	13583	1741	16.53	7.29	53.144	112.27
14. West Hartlepool C.B.	64.0	13.3	176.89	38259	1886	7.80	1.44	2.074	20.59
15. Greenock B.	64.0	13.3	176.89	11753	1886	20.29	11.05	122.103	146.97
16. Middlesbrough C.B.	61.3	10.6	112.36	26056	2283	11.42	2.18	4.752	23.11
17. Newport (Mon.) C.B.	61.0	10.3	106.09	41814	6360	3.43	5.81	33.756	59.84
18. Stoke on Trent C.B.	61.0	10.3	106.09	44769	4352	11.11	1.87	3.497	19.26
19. Salford C.B.	60.0	9.3	86.49	100803	10305	10.29	1.05	1.103	9.77
20. Sunderland C.B.	60.0	9.3	86.49	126031	15805	9.60	0.36	0.130	3.35
21. Belfast C.B.	59.8	9.1	82.81	126031	15805	7.96	1.28	1.638	11.65
22. Manchester C.B.	59.0	8.3	68.89	50208	6334	7.93	1.31	1.729	10.87
23. Bradford C.B.	58.8	8.1	65.61	9143	612	14.94	5.70	32.490	46.17
24. Oldham C.B.	58.0	7.3	53.29	5847	2533	2.31	6.93	48.023	50.59
25. Exeter C.B.	57.4	6.7	44.89	6543	1428	4.58	4.66	21.716	31.22
26. Rotherham C.B.	57.0	6.3	39.69	27608	1908	14.50	5.26	27.668	33.14
27. Carlisle C.B.	56.5	5.8	33.94	16591	1469	11.30	2.06	4.244	11.95
28. Tynemouth C.B.	55.8	5.1	26.01	9387	1407	6.67	2.57	6.605	13.11
29. Rochdale C.B.	55.0	4.3	18.49	12233	1725	7.09	2.15	4.623	9.25
30. Gateshead C.B.	55.0	4.3	18.49	29174	2756	10.59	0.31	0.260	2.04
31. Jarrow on Tyne M.B.	54.7	4.0	16.00	6222	713	8.73	5.46	29.812	21.29
32. West Bromwich C.B.	54.6	3.9	15.21	25840	1758	14.70	1.73	2.993	6.23
33. Derby C.B.	54.6	3.9	15.21	33921	3094	10.97	2.66	7.076	8.78
34. Cardiff C.B.	54.3	3.6	12.96	33038	3299	11.90	1.76	3.128	38.81
35. Huddersfield C.B.	54.0	3.3	10.89	33638	2555	21.00	1.41	1.988	0.56
36. Southampton C.B.	54.0	3.3	10.89	29112	4217	6.91	2.33	5.420	6.29
37. Brighton C.B.	53.4	2.7	7.29	21256	2925	7.27	1.97	3.881	2.56
38. Kingston upon Hull C.B.	52.0	1.3	1.69	116020	7751	14.97	5.73	32.833	4.58
39. Barrow in Furness C.B.	51.5	0.8	0.64	15775	1516	10.41	1.17	1.369	0.94
40. Wallasey C.B.	51.5	0.8	0.64	16847	2152	7.83	0.99	0.980	0.30
41. Leeds C.B.	51.1	0.4	0.16	110712	10822	10.23	5.92	35.046	4.05
42. Dudley C.B.	51.0	0.3	0.09	20010	1321	15.16	1.41	1.988	0.30
43. Walsall C.B.	50.7	0.6	0.36	6300	2533	2.49	6.75	45.563	4.05
44. Nottingham C.B.	50.1	0.7	0.49	39353	6914	5.69	3.55	12.603	2.49
45. Plymouth C.B.	50.0	0.8	0.64	39559	4490	8.81	0.43	0.185	0.34
46. Burnley C.B.	49.9	1.5	2.25	12606	1831	6.93	2.31	5.336	3.47
47. Stockport C.B.	48.2	2.3	5.29	35858	3038	11.81	2.57	6.605	5.91
48. South Shields C.B.	47.7	2.7	7.29	22488	2441	9.21	0.93	0.001	0.08
49. Worcester C.B.	46.2	4.5	20.25	15400	1256	12.26	3.02	9.120	13.59
50. Dewsbury C.B.	46.2	4.5	20.25	11136	1217	9.16	0.08	0.006	0.44
51. Coventry C.B.	45.2	5.7	32.49	30835	5643	5.46	3.78	14.288	21.55
52. Burton upon Trent C.B.	45.0	6.7	44.89	7580	1134	6.68	2.56	6.554	17.15
53. Newcastle upon Tyne C.B.	44.0	6.7	44.89	75675	6449	11.73	2.49	6.200	16.68
54. Swansea C.B.	44.0	6.7	44.89	42300	3350	12.64	3.40	11.560	22.78
55. Doncaster C.B.	44.0	7.1	50.41	13060	1697	7.70	1.54	2.372	10.93
56. Blackpool C.B.	43.6	7.3	53.29	10007	2326	8.17	1.07	1.145	7.81
57. Wolverhampton C.B.	43.4	7.7	59.29	15938	3362	4.74	4.50	20.230	34.65
58. Barnsley C.B.	43.0	7.7	59.29	23054	1663	13.87	4.63	21.437	35.65
59. Salford C.B.	43.0	7.8	60.84	10379	1608	6.46	2.78	7.728	21.68
60. Salford C.B.	42.9	8.7	75.69	86549	10522	8.23	1.01	1.020	8.79
61. Sheffield C.B.	42.0	8.9	79.21	13086	1892	6.92	2.32	5.382	20.65
62. Halifax C.B.	41.8	8.9	79.21	13086	1892	6.92	0.14	0.020	1.36
63. Blackburn C.B.	41.0	9.7	94.09	19472	2075	9.38	0.47	0.221	4.56
64. West Ham C.B.	41.0	9.7	94.09	40108	4573	8.77	3.00	9.000	29.10
65. Southampton C.B.	41.0	9.7	94.09	16081	1314	12.24	3.05	9.303	29.59
66. Birmingham C.B.	41.0	9.7	94.09	296545	21142	12.29	4.36	19.012	46.65
67. Bath C.B.	40.9	10.7	114.49	7490	1535	4.88	3.18	10.112	34.34
68. Wakefield C.B.	39.9	10.8	116.64	14916	1201	12.42	2.17	4.709	27.56
69. Bury C.B.	38.0	12.7	161.29	8201	1161	7.07	0.00	0.000	0.00
70. Croydon C.B.	38.0	12.7	161.29	47149	3100	9.24	4.17	17.389	53.79
71. Bolton C.B.	37.8	12.9	166.41	17153	3382	5.07	1.67	2.789	21.71
72. Darlington C.B.	37.7	13.0	169.00	13022	1721	7.57	5.06	25.604	68.82
73. Norwich C.B.	37.1	13.6	184.96	10355	2477	4.18	0.94	0.884	57.66
74. Bournemouth C.B.	35.2	15.5	240.25	12086	2189	5.52	0.94	0.884	14.66
75. Reading C.B.	35.1	15.6	243.36	25775	2533	10.18	1.46	2.132	23.21
76. Canterbury C.B.	34.8	15.9	252.81	5913	553	10.70	4.68	21.902	80.96
77. Portsmouth C.B.	33.4	17.3	299.29	23498	5149	4.56	2.73	7.453	48.31
78. Lincoln C.B.	33.0	17.7	313.29	8759	1345	6.51	1.99	3.900	106.20
79. Great Yarmouth C.B.	32.5	18.2	331.24	11079	1078	11.23	5.56	30.914	44.54
80. Southend on Sea C.B.	31.6	19.1	368.64	1779	3199	3.68	2.32	5.382	40.99
81. Eastbourne C.B.	31.5	19.2	368.64	6797	983	6.92	1.98	3.920	72.86
82. East Ham C.B.	30.0	20.7	428.49	20571	2835	7.26	3.52	12.390	18.02
83. Ipswich C.B.	30.0	20.7	428.49	13054	2281	5.72	0.85	0.723	101.12
84. Oxford C.B.	29.5	21.2	449.44	15907	1895	8.39	4.66	21.716	31.57
85. Bristol C.B.	29.0	21.7	470.89	127038	1942	13.90	1.31	1.716	44.39
86. Hastings C.B.	26.6	24.1	580.81	9536	1203	7.93	1.79	3.204	3.204
87. Renfrew B.	25.9	24.8	615.04	2592	348	7.45	1.80	3.240	51.30
88. Poole M.B.	22.2	28.5	812.25	12417	1667	7.44			
	4460.3		19991.11			812.91		1312.750	2230.60-1050.96 = 1179.64
n = 88	Mean :		Sa ²			Mean :		Sd ²	Sad n = 13.405
	50.7					9.24			

Standard Deviation of Infant Mortality Rate

Standard Deviation of Health Visiting Index

Coefficient of Correlation

Standard Error

15.0722

3.8623

+ 0.2301

± 0.1009

5. Of course, you will find it to require a great deal of time and effort.

1. The first thing you should do is to find out what the problem is.	10
2. Then you should try to find out what the cause of the problem is.	20
3. After that, you should try to find out what the effect of the problem is.	30
4. Finally, you should try to find out what the solution to the problem is.	40
5. Once you have found the solution, you should try to implement it.	50
6. After that, you should try to evaluate the results of the solution.	60
7. Finally, you should try to make sure that the solution is sustainable.	70
8. Once you have done all of these things, you should be able to solve the problem.	80
9. Finally, you should try to make sure that the solution is sustainable.	90
10. Once you have done all of these things, you should be able to solve the problem.	100

Table 7.

Incidence of the Common Causes of Infant Deaths, Bootle, 1938-1947.

Year.	Total Infant Deaths.	Gastro-enteritis and Diarrhoea.		Pneumonia.		Prematurity.	
		Deaths.	Percentage of Total Infant Deaths.	Deaths.	Percentage of Total Infant Deaths.	Deaths.	Percentage of Total Infant Deaths.
1938	126	6	4.8	24	19.1	33	26.2
1939	100	17	17.0	8	8.0	20	20.0
1940	122	9	7.4	29	23.8	21	17.2
1941	115	11	9.6	24	20.9	18	15.7
1942	80	9	11.2	19	23.8	16	20.0
1943	101	16	15.8	36	35.6	13	12.9
1944	96	13	13.5	25	26.0	18	18.8
1945	99	13	13.1	26	26.2	14	14.1
1946	135	23	17.0	26	19.3	31	23.0
1947	185	56	30.3	37	20.0	28	15.1

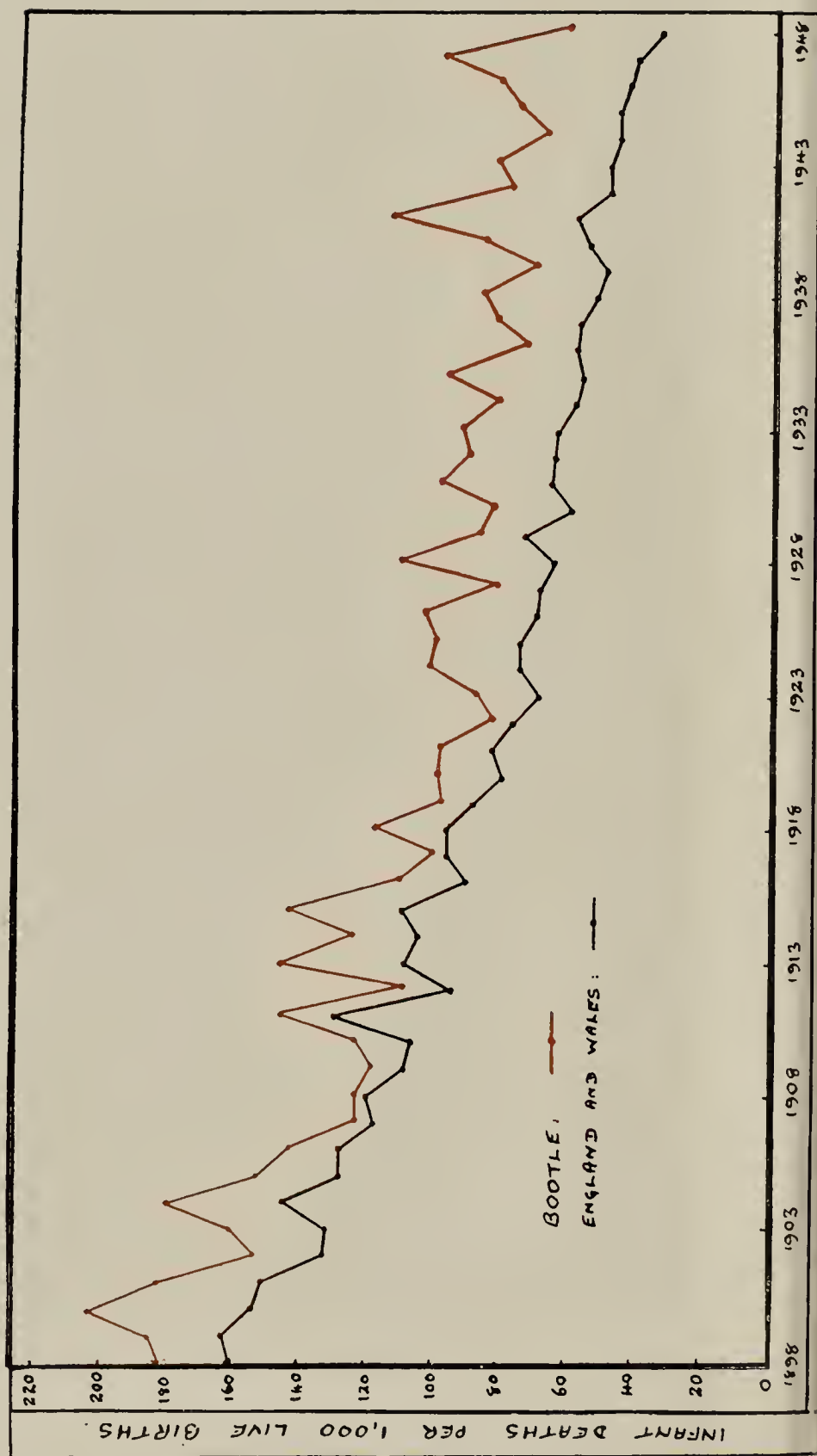
Table 8.

Birth Rates, Bootle and England and Wales, 1898—1948.

Year.	Birth Rate.	
	Bootle.	England and Wales.
1898	33·1	29·4
1899	33·5	29·2
1900	33·5	29·4
1901	31·4	28·5
1902	32·4	28·6
1903	33·1	28·4
1904	30·1	27·9
1905	32·9	27·9
1906	31·9	27·0
1907	31·3	26·3
1908	30·9	26·5
1909	29·9	25·6
1910	28·0	24·8
1911	30·2	24·4
1912	29·9	23·8
1913	30·0	23·9
1914	31·7	23·8
1915	27·6	21·9
1916	26·8	21·6
1917	24·4	17·8
1918	22·5	17·7
1919	23·9	18·5
1920	28·6	25·4
1921	26·6	22·4
1922	25·7	20·6
1923	24·5	19·7
1924	23·4	18·8
1925	23·3	18·3
1926	22·1	17·8
1927	21·4	16·7
1928	20·6	16·7
1929	19·5	16·3
1930	21·1	15·8
1931	21·6	15·8
1932	22·9	15·3
1933	21·4	14·4
1934	21·4	14·8
1935	21·4	14·7
1936	22·2	14·8
1937	22·0	14·9
1938	20·1	15·1
1939	21·1	15·0
1940	22·5	14·6
1941	22·8	14·2
1942	23·9	15·8
1943	26·5	16·5
1944	28·2	17·6
1945	24·4	16·1
1946	27·9	19·1
1947	30·4	20·5
1948	24·5	17·9

Figure 1.

Infant Mortality Rates, Bootle and England and Wales, 1898—1948.



Infant Mortality Rates, Bootle and England and Wales, 1898—1948.
Smoothed by method of least squares.

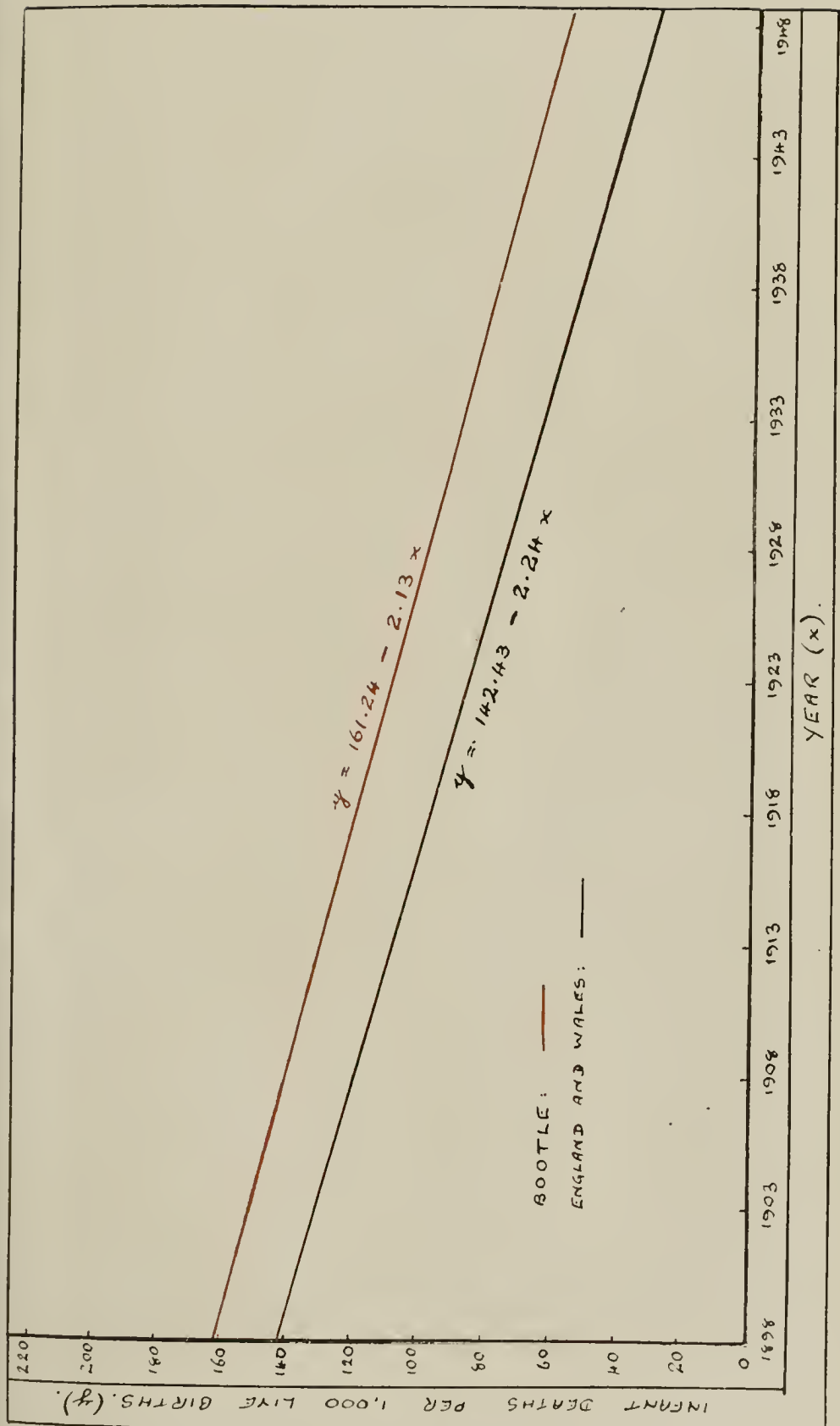
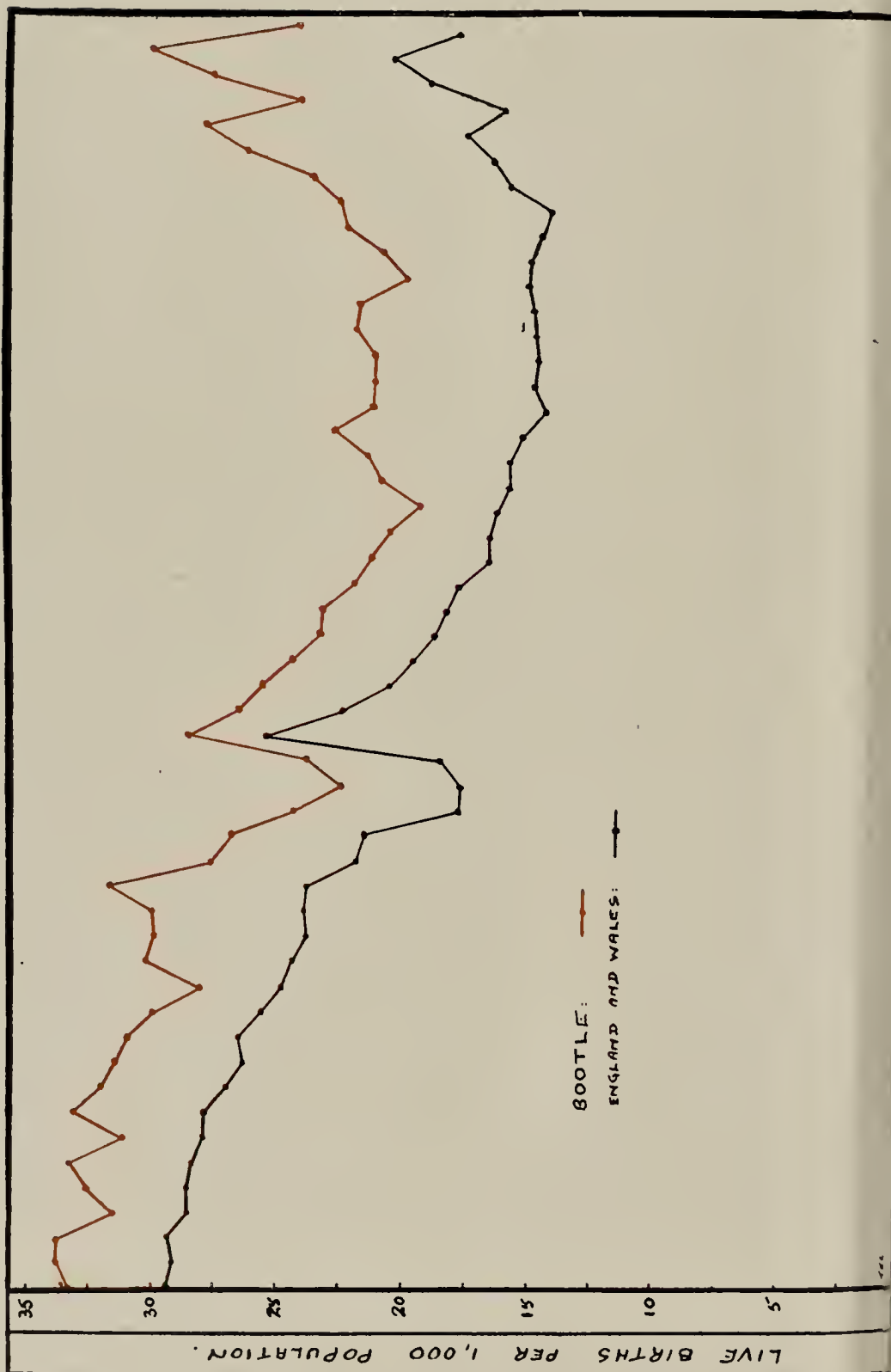


Figure 3.
Birth Rates, Bootle and England and Wales, 1898—1948.



COUNTY BOROUGH OF BOOTLE.

INFANT MORTALITY INVESTIGATION*All Details entered are to refer to circumstances at time of Child's Death.*

NAME OF CHILD
 ADDRESS Ward.....
 Cause of Death.....
 Time of P.M. (if any).....
 Date of Birth Date of Death.....
 Place of Death.....
 Sex/Male. Leg./Ill.

ANTE-NATAL HISTORY.

Supervision by:
 Date of First Attendance
 Doctor ,, ,, Last ,,
 Hospital No. of Attendances
 Midwife No. of Miscarriages
 Mother's Age at time of Birth
 Child No. of Stillbirths.....
 Mother's Work During Pregnancy
 Time of Ceasing such Work.....
 Abnormal Features noted in Ante-Natal Period

INTRA-NATAL RECORD.

Full-time: Yes, No.

Place of Birth: Home. If Prem., No. of Weeks
 Hospital
 Attended by: Doctor (name)..... Midwife (name).....
 Details and Duration of Labour
 Twin, Condition of Other Twin

POST-NATAL RECORD.

Condition at Birth Wt. at Birth: lbs.

Attendance at Infant Clinic:

Yes	Reg.
No.	Irreg.
Satis.	

 No. of VisitsGain in Weight during Life:
Unsatis.

Mother's Health After Delivery

Child's Sleeping Accommodation

Vaccination:

Yes
No.

 (Age:). Diph. Immun.:

Yes
No.

 (Age:**FEEDING.**Breast throughout Life: ☐Bottle ,, ,, : ☐

Date of Change from Breast to Bottle

If Bottle-fed, Details of Feeds—

Dried Milk (National): ☐Dried or Evap. Milk (Proprietary): ☐

Brand

Liquid Milk (T.T.) ☐,, ,, (Pasteurised) ☐,, ,, (Sterilised) ☐,, ,, (Undesignated) ☐

Supplier:

Was Milk brought to Boil in Preparing Feeds:

YES

NO

Storage of Milk:

SATIS.

UNSATIS.

Storage of Food:

SATIS.

UNSATIS.

H.V.'s Impression of General Cleanliness:

EXCELLENT

GOOD

MODERATE

BAD

H.V.'s Impression of Facilities for Sterilising Utensils
and Preparing Clean Feeds:

EXCELLENT

GOOD

MODERATE

BAD

H.V.'s Impression of Parent's Ability and Aptitude in
this matter:

EXCELLENT

GOOD

MODERATE

BAD

Any Other Relevant Observations

FATAL ILLNESSES (Insert Age at Time in Weeks).

..... W. Cough..... Measles..... Pneumonia..... S. Fever.....

S

HISTORY OF FATAL ILLNESS.

Date of onset.....

and Symptoms.....

was done for Child at onset of Illness and subsequently?.....

of Calling in G.P..... Name of G.P.....

of Removal to Hospital..... Name of Hosp.....

tion on Removal to Hosp.....

of Discharge from Hosp. if prior to Death

HOME CIRCUMSTANCES.

COMFORTABLE

MODERATE

POOR

ADEQUATE

INADEQUATE

CLEAN

MODERATE

DIRTY

UNTIDY

ties for Washing Napkins, etc.:

stance with Housekeeping

DETAILS OF FATHER.

Age.....

ty:

ABSTAINER

LIGHT DRINKER

HEAVY DRINKER

VERY HEAVY DRINKER

h

ad, Cause of Death.....

ation

Work:

REGULAR

IRREGULAR

AT HOME

AWAY FROM HOME

employed, for how long prior to Birth?

Significant Hereditary Factors.....

FAMILY DETAILS (All Children, Alive or Dead):

[illegible]

ANY ADDITIONAL COMMENTS BY H.V.:

FOR OFFICE USE.

HOUSING.	
SAN. DEFECTS:	RELEVANT
	IRRELEVANT
OVERCROWDING:	NONE
	SLIGHT

Date of Inspection.....	OWNER
	OCCUPIER
	RENTAL..... Outskirts Re-housing: Central
	OCCUPANTS: C.....A.....Total.....No. of Families.....
	TYPE OF HOUSE: Back to Back; Single Back; Through; Scotch; Tenement

	Attics.....Cellars
	Storeys..... Rooms..... Cellars..... Occupied?.....
	Approx. height of Building.....Width of Street.....
	Approx. height of opposite Buildings: Front..... Rear.....
ADDRESS.....	SANITARY ACCOMN.
	Type and Position.....
	SINK..... Position..... Untrapped Connected
	REFUSE ACCOMN..... Sufficiency.....
	WATER SUPPLY..... Position.....
	DAMPNESS and Cause
	(Rising)

	(Penetrating)

ADDRESS.....	YARD, COURT or PASSAGE..... Yard Area.....
	(Paving)

	(Drainage)

	SECONDARY MEANS of ACCESS: Yes..... No.....

	BAD ARRANGEMENT of HOUSE.....

DARKNESS

(a) Rooms

.....

.....

.....

(b) Staircase(s)

.....

LACK OF AIR SPACE (with special reference to congestion).....

.....

.....

LACK OF VENTILATION

.....

.....

STORAGE FOR FOOD

COOKING FACILITIES

PROVISION FOR FAMILY WASHING.....

BYE-LAW INFRINGEMENTS

Yard area less than 150 sq. ft.....

External or party wall less than 8½" thick.....

Window area less than 1/10th of floor area in.....

Window opening area less than 1/20th of floor area in.....

Window head less than 6' 6" from floor in.....

Ceiling less than 8' 0" from floor in.....

No permanent means of ventilation to.....

No handrail to Staircase

No evidence of a damp proof course.....

.....

Is house unfit?

Is house capable of being made fit at reasonable expense?.....

Estimated cost of works necessary to render house fit.....

If house is not capable of being made fit describe reason.....

..... Inspector.....

